Work Order No. 15730.001.009

No. 1 and 2 Combination Boilers
Sulfur Dioxide
Emission Test Report
New-Indy Catawba, LLC
Catawba, South Carolina
Test Dates: 13-14 October 2021

Prepared For

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29 October 2021

WESTON SOLUTIONS, INC. (WESTON®)
INTEGRATED AIR SERVICES – AUBURN OPERATIONS
ACCREDITATION STIPULATION

Laboratory:	Weston Solutions, Inc.
Accreditor(s):	Louisiana Environmental Laboratory Accreditation Program (LELAP) – Laboratory and Emission Testing Practice
Accreditation ID:	LELAP – 03024
Scope:	Sulfur Dioxide Sampling and Analysis
Effective:	LELAP – 21 December 2001
Renewal Date:	LELAP – 30 June 2022

Data Qualifiers

The following are general reporting notes that are applicable to all WESTON reports, unless otherwise noted.

- **NL** denotes data that was not from a LELAP accredited method.
- **LNL** denotes lab results that are not from an accredited LELAP laboratory.
- **NN** denotes data that was not from The NELAC Institute (TNI) accredited method.
- **NNL** denotes lab results that are not from an accredited TNI laboratory.
- **ED** denotes data that is not to be used for compliance purposes and may deviate from approved procedures.
- **Q** denotes data whose QA/QC check did not fall within the specified range. This data is still considered valid.
- **A** denotes data that is anomalously high with no explanation for the outlier.
- **BDL** denotes values that were below the limit of detection of the analyzer and 2% of the span gas was used to calculate an emission rate.
- **DF** denotes a dilution factor.
- **NAP** denotes emission testing performed by personnel from a non-TNI accredited laboratory.
- **S** denotes analysis that has been subcontracted.
- All values are reported on a "dry" basis, unless otherwise designated as "actual" or "wet" basis.

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SECTION 1
INTRODUCTION

Weston Solutions, Inc. (WESTON®) was contracted by New-Indy Catawba, LLC (NIC) to conduct emission testing on the No. 1 and 2 Combination Boilers (CB) at the NIC mill in Catawba, South Carolina. The purpose of the testing was to document the emissions from sources identified in Condition No. 5 (Order to Correct Undesirable Level of Air Contaminants) issued by the South Carolina Department of Health and Environmental Control (SC DHEC).

WESTON performed the emission testing during 13-14 October 2021. The project team included the following individuals.

Name	Project Role
Wayne Roberts	Project Manager
Van Dubay	Test Team Leader
Robert Scroggins	Test Team Member
Brock Ennis	Test Team Member
Natalie Hammonds	Quality Assurance Manager
Ashley Bryant	Report Coordinator

Mr. Dan Mallett of NIC coordinated the testing with mill operations and served as WESTON's technical contact throughout the effort. Mr. James Justice of SC DHEC was present during the testing.

The Louisiana Environmental Laboratory Accreditation Program (LELAP) is the accrediting body through which WESTON obtains both its LELAP and TNI accreditations. WESTON is accredited for operations in the states of Texas, Florida, and Virginia through reciprocity agreements with LELAP.

SECTION 2
RESULTS AND DISCUSSION

WESTON performed the emissions testing program during 13-14 October 2021. All testing was performed by personnel from the WESTON emission testing office in Auburn, Alabama.

The June testing was conducted under non-representative conditions while the mill was still in the startup period. The conditions for this test were more representative of normal operations because there was a higher average Kappa value of 83.3; mill steam demand was higher; and more wood was combusted in the boilers.

Stratification checks, response time checks, and cyclonic flow checks were performed on the sources. The sources are neither stratified nor cyclonic. Results of these tests can be found in the Quality Control Appendix.

Table 2-1 provides a summary of the mean emission results for each source. Tables 2-2 through 2-5 provide detailed summaries of the emission results. Measurement uncertainty is not shown but has been taken into consideration during method development. Any differences between the calculated results presented in the appendices and the results reported in the summary tables are due to rounding for presentation.

There were no operational or sampling complications during the field testing that impacted the data, and the reported test results are believed representative of the emissions encountered during the test periods.

TABLE 2-1
SUMMARY OF MEAN EMISSION RESULTS

Source/Parameter	Mean Test Value
No. 1 Combination Boiler (Condition 1: NCG & SOG Gases) Sulfur Dioxide, lb/hr	342.8
No. 1 Combination Boiler (Condition 2: NCG Gases Only) Sulfur Dioxide, lb/hr	230.7
No. 2 Combination Boiler (Condition 1: NCG & SOG Gases) Sulfur Dioxide, lb/hr	380.9
No. 2 Combination Boiler (Condition 2: NCG Gases Only) Sulfur Dioxide, lb/hr	309.9

TABLE 2-2
NO. 1 COMBINATION BOILER
CONDITION 1: NCG AND SOG GASES
SUMMARY OF SO_2 EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	10/13/21	10/13/21	10/13/21	----
Time Began	0844	1029	1206	----
Time Ended	0944	1129	1306	----
Stack Gas Data				
Temperature, °F	430	435	438	434
Velocity, ft/sec	64	63	63	63
Moisture, %	17	17	17	17
CO_2 Concentration, %	8.8	9.0	8.6	8.8
O_2 Concentration, %	10.5	10.5	10.8	10.6
VFR, x 10^5 dscfm	1.46	1.45	1.44	1.45
Sulfur Dioxide				
Concentration, ppm	280	227	204	237
Emission Rate, lb/hr	407.4	328.3	292.6	342.8

TABLE 2-3
NO. 1 COMBINATION BOILER
CONDITION 2: NCG GASES ONLY
SUMMARY OF SO_2 EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	10/13/21	10/13/21	10/13/21	----
Time Began	1407	1544	1714	----
Time Ended	1507	1644	1814	----
Stack Gas Data				
Temperature, °F	447	450	444	447
Velocity, ft/sec	61	62	63	62
Moisture, %	17	18	16	17
CO_2 Concentration, %	9.6	9.9	8.9	9.5
O_2 Concentration, %	10.1	9.8	10.7	10.2
VFR, x 10^5 dscfm	1.37	1.39	1.43	1.40
Sulfur Dioxide				
Concentration, ppm	140	176	180	165
Emission Rate, lb/hr	191.3	243.6	257.0	230.7

TABLE 2-4
NO. 2 COMBINATION BOILER
CONDITION 1: NCG AND SOG GASES
SUMMARY OF SO_2 EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	10/14/21	10/14/21	10/14/21	----
Time Began	0830	1026	1222	----
Time Ended	0930	1126	1322	----
Stack Gas Data				
Temperature, °F	463	477	465	469
Velocity, ft/sec	63	68	61	64
Moisture, %	17	19	16	17
CO_2 Concentration, %	8.2	9.5	7.5	8.4
O_2 Concentration, %	10.8	10.1	11.5	10.8
VFR, x 10^5 dscfm	1.40	1.43	1.35	1.39
Sulfur Dioxide				
Concentration, ppm	275	262	286	274
Emission Rate, lb/hr	383.7	373.7	385.4	380.9

TABLE 2-5
NO. 2 COMBINATION BOILER
CONDITION 2: NCG GASES ONLY
SUMMARY OF SO_2 EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	10/14/21	10/14/21	10/14/21	----
Time Began	1410	1547	1725	----
Time Ended	1510	1647	1825	----
Stack Gas Data				
Temperature, °F	457	461	460	459
Velocity, ft/sec	59	59	58	59
Moisture, %	15	15	15	15
CO_2 Concentration, %	7.2	7.6	7.0	7.3
O_2 Concentration, %	11.9	11.2	11.7	11.6
VFR, x 10^5 dscfm	1.33	1.33	1.33	1.33
Sulfur Dioxide				
Concentration, ppm	235	234	232	234
Emission Rate, lb/hr	311.3	311.0	307.4	309.9

SECTION 3
SOURCE TESTING METHODOLOGY

The emission testing program was conducted in accordance with the U.S. EPA Reference Methods summarized in Table 3-1. Method descriptions and quality assurance data are provided in the referenced appendices.

TABLE 3-1
SOURCE TESTING METHODOLOGY

Parameter	Method Number	Appendix Reference		Comments
		Method Description	Quality Control Data	
Volumetric Flow Rate	1,2,4	B.1	D	
Gas Composition	3A	B.2	D	Instrumental
Sulfur Dioxide	6C	B.3	D	Instrumental

These results meet all requirements of TNI unless otherwise specified.

The results within this report relate only to the samples listed in the body of this report.

SECTION 4
QUALITY ASSURANCE/ QUALITY CONTROL

4.1 QUALITY CONTROL PROCEDURES

As part of all testing, WESTON implements a QA/QC program. The field team leader is responsible for implementation of field QA/QC procedures. Individual laboratory managers are responsible for implementation of analytical QA/QC procedures. The overall project manager and the Quality Assurance Manager oversee all QA/QC procedures to ensure that sampling and analyses meet the QA/QC requirements and that accurate data results are generated from the test program.

4.2 GAS STREAM SAMPLING QA/QC PROCEDURES

General checks that are conducted during testing and apply to all methods include the following:

- Performance of leak checks.
- Use of standardized forms, labels, and checklists.
- Maintenance of sample traceability.
- Collection of appropriate blanks.
- Use of calibrated instrumentation.
- Review of data sheets in the field to verify completeness.
- Use of validated spreadsheets for calculation of results.

The following section details the specific procedures applied to the reference method sampling system.

Instrumental Reference Method Sampling Systems

- The sampling system (probe to sample conditioner) is leak-checked prior to the testing.

- All analyzers are calibrated prior to testing to ensure precise and accurate data. Protocol standards are used to calibrate each of the analyzers. Each analyzer is calibrated at three to four points (zero, low, mid, and high range) depending on reference method requirements. Nitrogen or hydrocarbon-free air is used to set the instrument zero. The CO_2 and O_2 calibration standards are 40 to 60 and 100% of span.

- Pre- and post-test calibration bias and calibration drift tests are performed for each test run. The bias check is performed with the calibration standard that is closest to the observed concentration in the sample gas. The average pretest/posttest bias did not exceed 5% of full scale. The calibration drift did not exceed 3%.

- Prior to formal testing, a 12-point stratification check is performed at the test location. Alternatively, per Section 8.1.2 of EPA Method 7E, a three-point stratification check passing through the centroidal area of the stack is performed. The three points (16.7, 50, and 83.3% of the stack diameter) are sampled a minimum of two times the system response.

- A response time check is performed before sampling. Sample flow rate must be maintained within 10% of the flow rate at which the system response time was measured.

- A permanent data record of analyzer responses is recorded using computer software designed by WESTON.

4.3 QA/QC CHECKS FOR DATA REDUCTION AND VALIDATION

All data and/or calculations for flow rates and moisture contents, which are made using a computer software program, are validated by an independent check. In addition, all calculations are spot checked for accuracy and completeness by the Field Team Manager.

In general, all measurement data are validated based on the following criteria:

- Process conditions during sampling or testing.
- Acceptable sample collection procedures.
- Consistency with expected or other results.
- Adherence to prescribed QC procedures.

Any suspect data are flagged and identified with respect to the nature of the problem and potential effect on the data quality.

Upon completion of testing, the Field Team Manager is responsible for preparation of a complete data summary including calculation results, raw data sheets, and laboratory reports.

APPENDIX A
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS

No. 1 Combination Boiler
Run No. 1

Meter Pressure (Pm), in. Hg

$$Pm = Pb + \frac{\Delta H}{13.6\, in.H_2O/in.Hg}$$

where, Pb = barometric pressure, in. Hg
ΔH = Pressure differential of orifice in. H_2O

$$Pm = 29.70\ in.\ Hg + \frac{1.300\ in.\ H_2O}{13.6\ in.\ H_2O/in.\ Hg} = 29.80\ in.\ Hg$$

Absolute Stack Gas Pressure (Ps), in. Hg

$$Ps = Pb + \frac{Pg}{13.6\, in.H_2O/in.Hg}$$

where, Pb = barometric pressure, in. Hg
Pg = Static Pressure, in. H_2O

$$Ps = 29.70\ in.\ Hg + \frac{-1.20\ in.H_2O}{13.6\ in.\ H_2O/in.\ Hg} = 29.61\ in.\ Hg$$

Standard Meter Volume (Vmstd), dscf

$$Vmstd = \frac{17.64°R/in.Hg\ x\ Y\ x\ Vm\ x\ Pm}{Tm}$$

where, Y = meter correction factor
Vm = meter volume, dscf
Pm = meter pressure, in. Hg
Tm = meter temperature, °R

$$Vmstd = \frac{17.64\ °R/in.\ Hg\ x\ 1.000\ x\ 38.509\ dscf\ x\ 29.80\ in.\ Hg}{533.3\ °R} = 37.952\ dscf$$

Standard Wet Volume (Vwstd), scf

$$Vmstd = 0.04707\ ft^3/mL\ x\ Vlc$$

where, Vlc = volume of H_2O collected, mL

$$Vmstd = 0.04707\ ft^3/mL\ x\ 168.0\ mL = 7.908\ scf$$

Moisture Fraction (Measured), (Bws)

$$Bws = \frac{Vwstd}{(Vwstd + Vmstd)} = \frac{7.908\ scf}{7.908\ scf + 37.952\ dscf} = 0.172$$

where, Vwstd = standard wet volume, scf
Vmstd = standard meter volume, dscf

Moisture %, (Bws %)

$$Bws = Bws \times 100 = 0.172 \times 100 = 17.2$$

where, Bws = moisture fraction, measured or at saturation, whichever is lowest

Molecular Weight (DRY) (Md), lb/lb-mole

$$Md = (0.44 x \%CO_2) + (0.32 x \%O_2) + (0.28(100 - \%CO_2 - \%O_2))$$

$$Md = (0.44 \times 8.8) + (0.32 \times 10.5) + (0.28\ (100 - 8.8 - 10.5)) = 29.83\ lb/lb\text{-}mole$$

Molecular Weight (WET) (Ms), lb/lb-mole

$$Ms = Md\ (1 - Bws) + 18(Bws)$$

where, Md = molecular weight (DRY), lb/lb-mole
Bws = moisture fraction, dimensionless

$$Ms = 29.83\ lb/lb\text{-}mole\ (1 - 0.172) + 18\ (0.172) = 27.79\ lb/lb\text{-}mole$$

Average Velocity (Vs), ft/sec

$$Vs = 85.49 \frac{ft}{sec} \sqrt{\frac{(lb/lb\text{-}mole)(in.Hg)}{(°R)(in.H_2O)}} \times Cp \times \sqrt{Delta\ P}\ avg. \times \sqrt{\frac{Ts}{Ps \times Ms}}$$

where, Cp = pitot tube coefficient
Delta P = velocity head of stack gas, in. H_2O
Ts = absolute stack temperature, °R
Ps = absolute stack gas pressure, in. Hg
Ms = molecular weight of stack gas, lb/lb-mole

$$Vs = 85.49\ \frac{ft}{sec} \sqrt{\frac{(lb/lb\text{-}mole)\ (in.\ Hg)}{(°R)(in.H_2O)}} \times 0.84 \times 0.854\ in.\ H_2O \times \sqrt{\frac{890.1\ °R}{29.61\ in.\ Hg \times 27.79\ lb/lb\text{-}mole}}$$

$$Vs = 63.75\ ft/sec$$

Average Stack Gas Flow at Stack Conditions (Qa), acfm

$$Qa = 60\ sec/min\ x\ Vs\ x\ As$$

where, Vs = stack gas velocity, ft/sec
As = cross-sectional area of stack, ft^2

$$Qa = 60\ sec/min\ x\ 63.75\ ft/sec\ x\ 78.54\ ft^2 = 3.00\ E+05\ acfm$$

Average Stack Gas Flow at Standard Conditions (Qs), dscfm

$$Qs = 17.64\ \frac{°R}{in.\ Hg}\ x\ Qa\ x\ (1 - Bws)\ x\ \frac{Ps}{Ts}$$

where, Qa = average stack gas flow at stack conditions, ft^3/min
Bws = moisture content (dimensionless)
Ps = absolute stack gas pressure, in. Hg
Ts = absolute stack temperature, ^oR

$$Qs = 17.64\ \frac{°R}{in.\ Hg}\ x\ 3.00\ E+05\ \frac{acf}{min}\ x\ (1 - 0.172)\ x\ \frac{29.61\ in.\ Hg}{890.1\ °R} = 1.46\ E+05\ dscfm$$

Sulfur Dioxide Emission Rate (EMR), lb/hr

$$EMR = \frac{SO_2\ conc.\ x\ MW\ x\ Qs\ \frac{dscf}{min}\ x\ 60\ \frac{min}{hr}\ x\ 28.32\ \frac{L}{dscf}}{24.04\ \frac{L}{g\text{-}mole}\ x\ 1.0\ x\ 10^6\ \frac{\mu L}{L}\ x\ 454\ \frac{g}{lb}}$$

where, MW = molecular weight of SO_2, 64.06 g/g-mole
Qs = stack gas flow at standard conditions, dscfm

$$EMR = \frac{280\ ppm\ x\ 64.06\ \frac{g}{g\text{-}mole}\ x\ 1.46\ E+05\ \frac{dscf}{min}\ x\ 60\ \frac{min}{hr}\ x\ 28.32\ \frac{L}{dscf}}{24.04\ \frac{L}{g\text{-}mole}\ x\ 1.0\ x\ 10^6\ \frac{\mu L}{L}\ x\ 454\ \frac{g}{lb}} = 407.4\ lb/hr$$

APPENDIX B
TEST METHODOLOGY

B.1 VOLUMETRIC FLOW RATE

Mass emission rates are calculated by multiplying measured target analyte concentrations by calculated volumetric flow rates. Volumetric flow rates are determined using measurement data obtained by EPA Reference Methods 1-4.

The ductwork is measured at the sample location to the nearest 0.25 inch using a steel tape measure. Traverse points are selected in accordance with EPA Reference Method 1 on the basis of ductwork dimensions, geometry, and upstream and downstream disturbances. When a sample location does not meet EPA Reference Method 1 criteria, the maximum recommended number of traverse points are used.

Gas Velocity

The velocity of the gas stream is measured in accordance with EPA Reference Method 2 by reading the instantaneous velocity pressure at each traverse point using an "S" type pitot tube and a leveled, inclined manometer with a scale of 0 to 10 inches. In rare cases of highly negative pressure sources, a Magnahelic gauge with scales of 0 to 5 or 0 to 25 inches of water may be used in place of an inclined manometer. The stack pressure is calculated from the measured static pressure of the stack and the ambient barometric pressure corrected for elevation when applicable. The static pressure is measured by using the static side of the pitot tube, and the barometric pressure is measured using a calibrated aneroid barometer. The stack temperature is measured at each traverse point with a calibrated thermocouple and pyrometer.

Gas Composition and Moisture Content

The composition of the gas stream will be measured in accordance with EPA Reference Method 3 and/or 3A using an Orsat analyzer or Paramagnetic O_2 and Infrared CO_2 analyzers using Protcol-1 gases. Gas composition determinations are conducted using integrated sampling techniques.

Integrated samples are collected by withdrawing a sample from the M5 sampling train into a Tedlar sample bag.

The moisture content of the gas stream is determined according to EPA Reference Method 4, by collecting an integrated sample of source gas from a single point on the gas stream. At the conclusion of each run the volume of condensed moisture collected in the impingers of the sampling train is measured and used to evaluate the moisture content of the gas stream.

When sources are saturated or contain entrained water droplets, moisture content is also determined using the temperature measured at each traverse point and psychometric chart values corrected for stack pressure or by use of saturation vapor pressure tables. In these conditions, the lower moisture of the measured and saturation based values is used for volumetric flow rate calculations.

The molecular weight of the gas stream is calculated using the determined moisture, oxygen, and carbon dioxide concentrations. The balance of the gas stream is assumed to be nitrogen. The volumetric flow is then calculated at stack and standard conditions using the calculated molecular weight, the measured stack temperature, and measured velocity, stack and barometric pressures. Standard conditions are 68 °F and 29.92 inches of mercury and 0% moisture.

Data Acquisition and Reporting

Data are recorded at the time of collection on preprinted data sheets. Calculations are performed (where possible) with preprogrammed calculators or spreadsheet software.

Quality Control

Quality control procedures for volumetric flow measurements involve leak checks of pitot tubes, pitot tube lines and manometers; calibration of gas metering systems; and periodic calibration checks of thermocouples and pyrometers. Magnahelics are verified against inclined manometers prior to each use.

Data transfers are minimized. Data sheets are checked for completeness and accuracy. Calculations are verified by a second person.

B.2 GAS COMPOSITION (INSTRUMENTAL)

Oxygen (O_2) and carbon dioxide (CO_2) testing is conducted in accordance with EPA Reference Method 3A.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn continuously from the source through a heated probe, filter, and sample line to a sample conditioner which removes moisture from the gas stream. The sample is then transported to a Paramagnetic O_2 analyzer and an Infrared CO_2 analyzer.

Sample Analysis

The O_2 analyzer uses an electrochemical cell or a paramagnetic detector, and the CO_2 analyzer uses a non-dispersive infra-red (NDIR) detector to produce an electrical signal which is linearly proportional to the O_2 and CO_2 concentration, respectively.

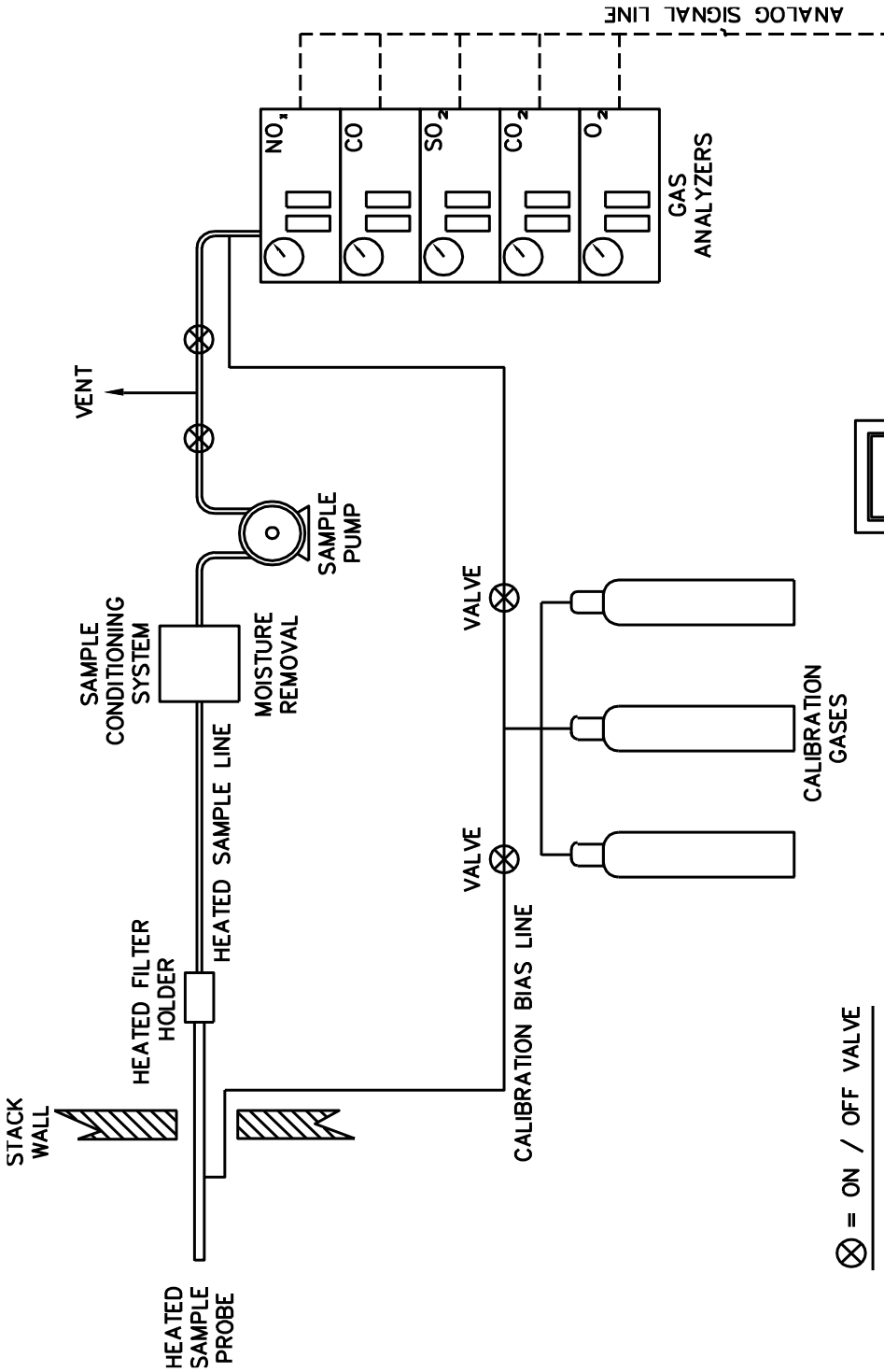


Figure B-1 Continuous Emission Monitoring System

Data Acquisition and Reduction

Data are acquired electronically using a computer with software designed by WESTON for EPA Reference Method 3A analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides one-minute averages during the sample run and an average concentration over the duration of the sample run.

Quality Control

At the time of analysis, O_2 and CO_2 in nitrogen calibration gases certified according to EPA Protocol-1, are used to calibrate the analyzer and to determine a bias correction factor for the entire system bias in accordance with EPA Reference Method 3A. The calibration gases are introduced directly to the analyzer to generate the calibration curve. A zero gas and an upscale calibration gas are introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is calculated using the ratio of the concentration measured from the sampling system and concentration measured directly at the analyzer. Sample run averages are corrected for system bias results.

B.3 SULFUR DIOXIDE (INSTRUMENTAL)

Sulfur dioxide (SO_2) testing is conducted in accordance with EPA Reference Method 6C.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn from the source through a heated probe, heated filter, and heated sample line to a sample conditioner which removes moisture from the gas stream. The sample is then transported to the analyzer through a Teflon® line.

Sample Analysis

The analyzer measures, at two discrete wavelengths, the absorption of ultraviolet radiation by the gas sample. The concentration of the components absorbing the light are then determined from relationships developed through application of the ideal gas law in concert with the laws of Bouguer, Beer, and Lambert.

Data Acquisition and Reduction

Data are acquired electronically using a computer with software designed by WESTON for EPA Reference Method 6C analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides bias-corrected averages.

Quality Control

At the time of analysis, SO_2 in nitrogen calibration gases (certified according to EPA Protocol-1) are used to calibrate the analyzer and to determine a bias correction factor for the entire system in accordance with EPA Reference Method 6C.

Calibration gases are introduced directly to the analyzer to generate the calibration curve. Zero level and upscale calibration gases are introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is then calculated using the ratio of the measured concentration of the bias gas introduced through the sampling system and the measured concentration of the bias gas introduced directly to the analyzer. Run averages are adjusted for this bias correction factor.

APPENDIX C
FIELD DATA – NO. 1 AND 2 COMBINATION BOILERS

NO. 1 COMBINATION BOILER
(CONDITION 1: NCG AND SOG GASES)

New Indy
Catawba, SC

15730.001.009
No. 1 Combination Boiler
Condition 1: NCGs & SOGs

EMISSION CALCULATIONS

	Run 1	Run 2	Run 3	Mean
Date	**10/13/21**	**10/13/21**	**10/13/21**	---
Time Began	**844**	**1029**	**1206**	---
Time Ended	**944**	**1129**	**1306**	---
Volumetric Flow Rate, (Qs), DSCFM	1.46E+05	1.45E+05	1.44E+05	1.45E+05
BWS	0.172	0.166	0.173	0.170
% Oxygen	10.5	10.5	10.8	10.6
Sulfur Dioxide MW= 64.06				
Concentration, ppm	280.0	227.0	204.0	237.0
Emission Rate, lb/hr	407.4	328.3	292.6	342.8

NIC PM and speciated TRS V2

New Indy
Catawba, SC

15730.001.009
No. 1 Combination Boiler

Condition 1: NCGs & SOGs

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		10/13/21	10/13/21	10/13/21	---
Time Began		844	1029	1206	---
Time Ended		1003	1150	1327	---
INPUT DATA					
Sampling Time, min	(Theta)	64	64	64	64
Stack Diameter, in.	(Dia.)	120.00	120.00	120.00	120.00
Barometric Pressure, in. Hg	(Pb)	29.70	29.70	29.70	29.70
Static Pressure, in. H2O	(Pg)	-1.20	-1.20	-1.20	-1.20
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	1.0000	1.0000	1.0000	1.0000
Orifice Calibration Value	(Delta H@)	2.0490	2.0490	2.0490	2.0490
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	38.509	38.464	38.991	38.655
Meter Temperature, °F	(Tm)	73.3	80.2	85.7	79.7
Meter Temperature, °R	(Tm-R)	533.3	540.2	545.7	539.7
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	168.0	158.4	166.5	164.3
CO2 Concentration, %	(CO2)	8.8	9.0	8.6	8.8
O2 Concentration, %	(O2)	10.5	10.5	10.8	10.6
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.854	0.846	0.845	0.848
Stack Temperature, °F	(Ts)	430.1	435.1	437.7	434.3
Stack Temperature, °R	(Ts-R)	890.1	895.1	897.7	894.3
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	78.54	78.54	78.54	78.54
Stack Pressure, in. Hg	(Ps)	29.61	29.61	29.61	29.61
Meter Pressure, in. Hg	(Pm)	29.80	29.80	29.80	29.80
Standard Meter Volume, ft^3	(Vmstd)	37.952	37.425	37.555	37.644
Standard Water Volume, ft^3	(Vwstd)	7.908	7.456	7.837	7.734
Moisture Fraction (Measured)	(BWS)	0.172	0.166	0.173	0.170
Moisture Fraction (lower sat/meas)	(BWS)	0.172	0.166	0.173	0.170
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	29.83	29.86	29.81	29.83
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	27.79	27.89	27.77	27.82
Average Stack Gas Velocity, ft/sec	(Vs)	63.75	63.23	63.39	63.46
Stack Gas Flow, actual, ft^3/min	(Qa)	300436	297972	298702	299036
Stack Gas Flow, Std , ft^3/min	(Qs)	145904	145006	143801	144903
Calibration check	(Yqa)	0.9862	0.9931	0.9855	0.988
Percent difference from Y					-1.17%

NIC PM and speciated TRS V2

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	60 °F	K Factor	N/A
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.7 in. Hg → BAR-14		
Source	No. 1 Combination Boiler	Console ΔH@	2.05	Static Pressure	-1.2 in. H_2O		
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	152.9 mL		
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	15.1 g		
Run Number	1	Pitot ID/Coeff.	P284 / 0.84				
Date	10-13-2021	Thermo ID	AO25	Stack Area	78.54 ft^2		
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25 / 0.250 / 0.250 / 0.250			Filter ID	
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16	Sample ID	

Leak Checks

	Initial	Final
Volume, ft^3	0.003	0.060
@ Vac., in. Hg	15"	5"
Pitot	good	good

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	8:44			741.220									
D ~~A~~-1	4		.87	1.3	743.6	427	x	65	264	263	x	65	1	
2	8		.86	1.3	746.1	426	x	66	261	269	x	60	1	
3	12		.80	1.3	748.4	427	x	67	260	267	x	58	1	
4	16		.68	1.3	750.8	426	x	69	261	264	x	61	1	
A ~~B~~-1	20		.86	1.3	753.3	429	x	71	263	266	x	65	1	
2	24		.71	1.3	755.6	430	x	71	259	266	x	63	1	
3	28		.72	1.3	758.0	431	x	74	257	266	x	65	1	
4	32		.55	1.3	760.5	430	x	74	259	266	x	64	1	
B ~~C~~-1	36		.79	1.3	762.9	430	x	75	259	263	x	65	1	
2	40		.68	1.3	765.3	432	x	77	259	264	x	63	1	
3	44		.57	1.3	767.7	432	x	77	257	265	x	62	1	
4	48		.55	1.3	770.1	432	x	77	260	263	x	62	1	
C ~~D~~-1	52		.84	1.3	772.5	432	x	77	258	266	x	64	1	
2	56		.79	1.3	774.9	434	x	77	257	266	x	59	1	
3	60		.75	1.3	777.3	432	x	78	259	262	x	57	1	
4	64	10:03	.79	1.3	779.729	432	x	78	254	266	x	58	1	
*Barometric Pressure is at port elevation			Avg √Δp ~~.7375~~ .6536	Avg ΔH 1.3	Total Volume 38.509	Avg T_s 430.125		Avg T_m 73.31	Min/Max 254/264	Min/Max 262/269	Min/Max	Max Temp 65	Max Vac 1	V_{m-std}, scf
				Avg √ΔH 1.140										

10/14/21

Flue Gas Composition

Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check

Meter Temp., °F
Ref. Temp, °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by AB

Comments AB 10/27

WESTON SOLUTIONS®
Integrated Air Services

15730.001.009 #1-2 CBs SO2 Emission Report

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	73 °F	K Factor	N/A
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.7 in. Hg → BAR-14		
Source	No. 1 Combination Boiler	Console ΔH@	2.0549 AB 10/20	Static Pressure	-1.2 in. H_2O		
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	152.1 mL		
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	6.3 g		
Run Number	2	Pitot ID/Coeff.	P284 / 0.84				
Date	10-13-2021	Thermo ID	AO25	Stack Area	78.54 ft^2		
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25 / 0.250 / 0.250 / 0.250				
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16		

Leak Checks

	Initial	Final
Volume, ft^3	0.001	0.000
@ Vac., in. Hg	15"	4"
Pitot	good	good

Filter ID

Sample ID

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	10:29			779.850									
B ~~A~~-1	4		.80	1.3	782.2	432	x	78	258	262	x	67	1	
2	8		.65	1.3	784.5	432	x	78	259	264	x	58	1	
3	12		.57	1.3	786.9	430	x	78	258	263	x	55	1	
4	16		.55	1.3	789.3	431	x	78	258	264	x	55	1	
A ~~B~~-1	20		.81	1.3	791.7	430	x	78	257	260	x	57	1	
2	24		.71	1.3	794.1	436	x	79	255	260	x	52	1	
3	28		.65	1.3	796.5	436	x	79	257	265	x	50	1	
4	32		.57	1.3	798.9	436	x	79	257	267	x	61	1	
D ~~C~~-1	36		.84	1.3	801.3	435	x	80	260	262	x	60	1	
2	40		.83	1.3	803.8	439	x	80	261	264	x	55	1	
3	44		.79	1.3	806.2	440	x	81	261	261	x	54	1	
4	48		.67	~~1.3~~ 1.3	808.6	437	x	82	261	262	x	56	1	
C ~~D~~-1	52		.82	1.3	811.0	430	x	83	257	259	x	63	1	
2	56		.80	1.3	813.4	435	x	83	260	260	x	57	1	
3	60		.74	1.3	815.9	444	x	83	258	262	x	55	1	
4	64	11:50	.70	1.3	818.314	438	x	84	255	258	x	57	1	
*Barometric Pressure is at port elevation			Avg √Δp .7187 .8458 10/14/21	Avg ΔH 1.3	Total Volume 38.464	Avg T_s 435.06		Avg T_m 80.189	Min/Max 255/261	Min/Max 258/267	Min/Max	Max Temp 67	Max Vac 1	$V_{m\text{-}std}$, scf

Avg √ΔH 1.0140

Flue Gas Composition

Oxygen, %

Carbon Dioxide, %

Moisture, %

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run

Post-run

Thermocouple Check

Meter Temp., °F

Ref. Temp., °F

Result

Q_s, dscfm

% Isokinetic

Calculated by

QC by AB

Comments AB 10/20

WESTON SOLUTIONS® Integrated Air Services

15730.001.009 #1-2 CBs SO2 Emission Report

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	75 °F	K Factor	N/A
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.7 in. Hg		
Source	No. 1 Combination Boiler	Console ΔH@	2.05	Static Pressure	-1.2 in. H_2O		
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	156.2 mL		
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	10.3 g		
Run Number	3	Pitot ID/Coeff.	P284 / 0.84				
Date	10-13-21	Thermo ID	AO25	Stack Area	78.54 ft^2		
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25 / 0.250 / 0.250 / 0.250			Filter ID	
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16	Sample ID	

*Barometric Pressure is at port elevation

Leak Checks

	Initial	Final
Volume, ft^3	0.001	0.000
@ Vac., in. Hg	15"	4"
Pitot	good	good

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	12:06			818.430									
D ~~A~~ 1	4		.83	1.3	820.9	435	x	83	257	264	x	62	1	
2	8		.80	1.3	823.2	435	x	83	259	264	x	60	1	
3	12		.76	1.3	825.9	432	x	83	260	262	x	60	1	
4	16		.64	1.3	828.3	435	x	84	260	261	x	61	1	
A ~~B~~ 1	20		.82	1.3	830.9	433	x	84	257	263	x	63	1	
2	24		.74	1.3	833.1	435	x	84	258	258	x	61	1	
3	28		.63	1.3	835.5	437	x	84	259	260	x	61	1	
4	32		.57	1.3	837.9	436	x	84	259	260	x	61	1	
B ~~C~~ 1	36		.75	1.3	840.5	432	x	85	258	264	x	64	1	
2	40		.70	1.3	842.9	437	x	87	260	258	x	62	1	
3	44		.57	1.3	845.3	439	x	88	257	263	x	62	1	
4	48		.56	1.3	847.7	441	x	88	259	257	x	64	1	
C ~~D~~ 1	52		.83	1.3	850.1	441	x	~~87~~ 88	260	257	x	66	1	
2	56		.80	1.3	852.5	446	x	88	266	258	x	66	1	
3	60		.74	1.3	855.0	446	x	89	258	263	x	67	1	
4	64	13:27	.71	1.3	857.421	443	x	89	259	258	x	68	1	
			Avg √Δp ~~.7125~~ .6648	Avg ΔH 1.3	Total Volume 38.991	Avg T_s 437.689		Avg T_m 85.689	Min/Max 257/260	Min/Max 257/264	Min/Max	Max Temp 68	Max Vac 1	$V_{m\text{-}std}$ scf
				Avg √ΔH 1.140										

10/14/21

Flue Gas Composition

Oxygen, %

Carbon Dioxide, %

Moisture, %

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run

Post-run

Thermocouple Check

Meter Temp., °F

Ref. Temp., °F

Result

Q_s, dscfm

% Isokinetic

Calculated by

QC by AM

Comments AB 10/27/21

WESTON SOLUTIONS® Integrated Air Services

15730.001.009 #1-2 CBs SO2 Emission Report

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 1 Combination Boiler
W.O. Number: 15730.001.009

Impingers 1 - 3 measurements in **grams**

Run No. 1 | Sample Date 10-13-21 | Recovery Date 10-13-21
Sample ID | Filter ID | Analyst RS

	Impingers 1	2	3		Imp. Total	Silica Gel grams	Total
Contents							
Final	891.1	722.0	544.8			810.9	
Initial	777.1 ✓	695.6 ✓	532.3 ✓		✓	795.8 ✓	
Gain	114.0 ✓	26.4 ✓	12.5 ✓		152.9	15.1 ✓	168 ✓

Impinger Color: clear | Labled? ✓
Silica Gel Condition: good | Sealed? ✓

Run No. 2 | Sample Date 10-13-21 | Recovery Date 10-13-21
Sample ID | Filter ID | Analyst RS

	Impingers 1	2	3		Imp. Total	Silica Gel grams	Total
Contents							
Final	904.6	714.7	539.6			817.2	
Initial	775.9 ✓	694.6 ✓	536.3 ✓		✓	810.9	
Gain	128.7 ✓	20.1 ✓	3.3 ✓		152.1	6.3 ✓	158.4 ✓

Impinger Color: clear | Labled? ✓
Silica Gel Condition: good | Sealed? ✓

Run No. 3 | Sample Date 10-13-21 | Recovery Date 10-13-21
Sample ID | Filter ID | Analyst RS

	Impingers 1	2	3		Imp. Total	Silica Gel grams	Total
Contents							
Final	901.1	736.8	541.6			802.5	
Initial	769.0 ✓	714.7 ✓	539.6 ✓		✓	792.2 ✓	
Gain	132.1 ✓	22.1 ✓	2 ✓		156.2	10.3 ✓	166.5 ✓

Impinger Color: clear | Labled? ✓
Silica Gel Condition: good | Sealed? ✓

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS®
Integrated Air Services

Sample and Velocity Traverse Points - Method 1

VD 10/13/21

Client: New Indy
Loaction/Plant: Catawba, SC
Operator: VD

Source: No. 1 Combination Boiler
W.O. Number: 15730.001.008
Date: 6/23/21

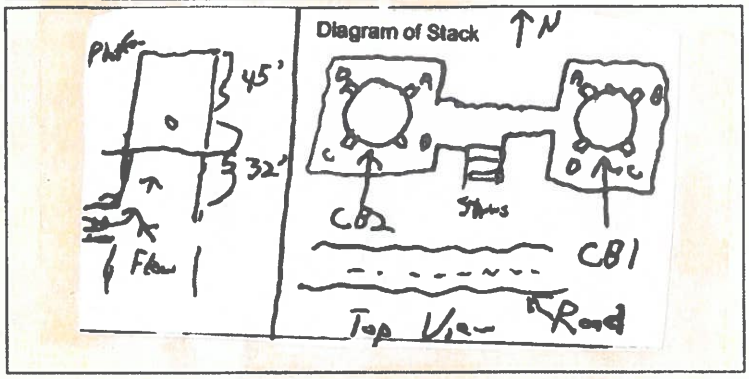
Duct Type ☑ Circular ☐ Rectangular
Traverse Type ☐ Particulate Traverse ☑ Velocity Traverse ☐ Stratification Traverse

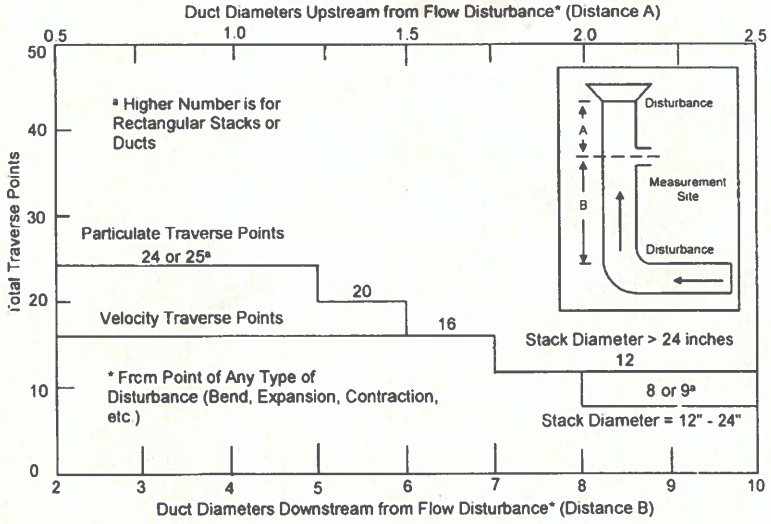
Depth, far wall to outside of port (in) = C	127.5
Port Depth (in) = D	7.5
Depth of Duct, diameter (in) = C - D	120
Area of Duct (ft^3)	78.54
Number of Ports	4
Traverse Points per Port	4
Total Traverse Points	16

Rectangular Ducts Only	
Width of Duct (in)	
Equivalent Diameter (in)	

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	3.9	11.4
2	10.5	12.6	20.1
3	19.4	23.3	30.8
4	32.3	38.8	46.3

Flow Disturbances	
Upstream - A (ft)	45
Downstream - B (ft)	32
Upstream - A (duct diameters)	4.5
Downstream - B (duct diameters)	3.2





Traverse Point Location % of Stack - Circular

Traverse Point Location	Number of Traverse Points 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25.0		14.6		10.5		8.2		6.7
3				75.0		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25.0
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75.0
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location % of Stack - Rectangular

Traverse Point Location	Number of Traverse Points 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Tape measure ID _____

RUN SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 08:44 to 09:44

Run Averages

	10.4	8.6	274

Pre-run Bias at 07:49

Zero Bias	0.0	0.1	6
Span Bias	10.1	9.9	446
Span Gas	10.1	10.2	458

Post-run Bias at 09:45

Zero Bias	0.1	0.2	9
Span Bias	10.1	9.9	442
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

	10.5	8.8	280

RUN SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 10:29 to 11:29

Run Averages

	10.4	8.7	224

Pre-run Bias at 09:45

Zero Bias	0.1	0.2	9
Span Bias	10.1	9.9	442
Span Gas	10.1	10.2	458

Post-run Bias at 11:30

Zero Bias	0.1	0.2	7
Span Bias	10.1	9.8	446
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

	10.5	9.0	227

RUN SUMMARY

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 12:06 to 13:06

Run Averages

	10.7	8.3	202

Pre-run Bias at 11:30

Zero Bias	0.1	0.2	7
Span Bias	10.1	9.8	446
Span Gas	10.1	10.2	458

Post-run Bias at 13:10

Zero Bias	0.0	0.2	5
Span Bias	10.0	9.7	448
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

	10.8	8.6	204

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
With NCG's & SOG's						
08:45	4357	11.1	3095	7.9	2870	280
08:46	4431	11.2	3028	7.7	2753	268
08:47	4389	11.1	3062	7.8	2713	264
08:48	4328	11.0	3118	7.9	2872	280
08:49	4360	11.1	3090	7.8	2932	286
08:50	4249	10.8	3174	8.0	2917	284
08:51	4160	10.6	3253	8.2	2805	273
08:52	4106	10.4	3301	8.4	2808	273
08:53	4241	10.8	3179	8.1	2888	281
08:54	4236	10.8	3196	8.1	2881	281
08:55	4044	10.3	3378	8.6	2937	286
08:56	4068	10.3	3358	8.5	2892	282
08:57	4137	10.5	3296	8.4	2800	273
08:58	4074	10.3	3351	8.5	2886	281
08:59	4043	10.3	3385	8.6	2968	289
09:00	4035	10.2	3392	8.6	2936	286
09:01	3989	10.1	3435	8.7	2897	282
09:02	4047	10.3	3400	8.6	2891	282
09:03	4126	10.5	3332	8.4	2876	280
09:04	4030	10.2	3418	8.7	2941	287
09:05	4034	10.2	3420	8.7	3002	293
09:06	4125	10.5	3353	8.5	2915	284
09:07	4164	10.6	3321	8.4	2768	269
09:08	4277	10.9	3233	8.2	2770	270
09:09	4258	10.8	3265	8.3	2796	272
09:10	4217	10.7	3301	8.4	2785	271
09:11	4194	10.6	3329	8.4	2759	269
09:12	4223	10.7	3305	8.4	2632	256
09:13	4233	10.7	3295	8.4	2646	257
09:14	4080	10.4	3432	8.7	2751	268
09:15	4087	10.4	3442	8.7	2881	281
09:16	4198	10.7	3352	8.5	2833	276
09:17	4239	10.8	3314	8.4	2723	265
09:18	4228	10.7	3326	8.4	2722	265
09:19	4340	11.0	3221	8.2	2744	267
09:20	4375	11.1	3187	8.1	2732	266
09:21	4283	10.9	3271	8.3	2756	268
09:22	4215	10.7	3335	8.5	2680	261
09:23	4176	10.6	3367	8.5	2727	265
09:24	4155	10.5	3392	8.6	2821	275

RUN DATA

Number 1

Client: **New Indy** Project Number: **15730.001.009**
Location: **Catawba, SC** Operator: **VD**
Source: **No. 1 Combination Boiler** Calibration **1** Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
09:25	4114	10.4	3429	8.7	2857	278
09:26	3987	10.1	3550	9.0	2878	280
09:27	4023	10.2	3516	8.9	2770	270
09:28	4043	10.3	3499	8.9	2706	263
09:29	4106	10.4	3445	8.7	2758	268
09:30	4461	11.3	3112	7.9	2740	267
09:31	4476	11.4	3094	7.8	2680	261
09:32	3905	9.9	3619	9.2	2668	260
09:33	3715	9.4	3799	9.6	2825	275
09:34	3782	9.6	3741	9.5	2912	284
09:35	3767	9.6	3754	9.5	2903	283
09:36	3699	9.4	3815	9.7	2957	288
09:37	3725	9.5	3800	9.6	2919	284
09:38	3836	9.7	3697	9.4	2783	271
09:39	3854	9.8	3692	9.4	2829	275
09:40	3801	9.7	3760	9.5	2829	275
09:41	3822	9.7	3743	9.5	2866	279
09:42	3864	9.8	3710	9.4	2817	274
09:43	3932	10.0	3669	9.3	2712	264
09:44	3812	9.7	3782	9.6	2727	265
Avgs	**4105**	**10.4**	**3399**	**8.6**	**2817**	**274**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
With NCG's & SOG's						
10:30	4169	10.6	3410	8.6	2250	218
10:31	4194	10.6	3384	8.6	2287	222
10:32	4335	11.0	3251	8.2	2358	229
10:33	4223	10.7	3356	8.5	2418	235
10:34	4168	10.6	3413	8.7	2371	230
10:35	4143	10.5	3425	8.7	2235	216
10:36	4037	10.3	3528	8.9	2249	218
10:37	3891	9.9	3666	9.3	2372	230
10:38	3802	9.7	3748	9.5	2459	239
10:39	3815	9.7	3739	9.5	2475	240
10:40	3884	9.9	3677	9.3	2406	233
10:41	3891	9.9	3670	9.3	2307	224
10:42	3914	9.9	3646	9.2	2319	225
10:43	3885	9.9	3674	9.3	2409	234
10:44	3953	10.0	3610	9.1	2440	237
10:45	3942	10.0	3620	9.2	2386	231
10:46	3947	10.0	3616	9.2	2310	224
10:47	3917	10.0	3640	9.2	2307	224
10:48	3928	10.0	3637	9.2	2321	225
10:49	3860	9.8	3698	9.4	2337	227
10:50	3899	9.9	3665	9.3	2343	227
10:51	3920	10.0	3642	9.2	2275	220
10:52	3829	9.7	3727	9.4	2258	219
10:53	3813	9.7	3744	9.5	2338	227
10:54	3936	10.0	3632	9.2	2309	224
10:55	3949	10.0	3614	9.2	2261	219
10:56	3814	9.7	3743	9.5	2294	222
10:57	3815	9.7	3739	9.5	2256	219
10:58	3913	9.9	3647	9.2	2250	218
10:59	3912	9.9	3650	9.2	2287	222
11:00	3910	9.9	3649	9.2	2293	222
11:01	4003	10.2	3559	9.0	2318	225
11:02	4020	10.2	3543	9.0	2316	225
11:03	4021	10.2	3541	9.0	2301	223
11:04	3998	10.2	3562	9.0	2344	227
11:05	3967	10.1	3594	9.1	2355	228
11:06	3955	10.0	3606	9.1	2355	228
11:07	4038	10.3	3529	8.9	2283	221
11:08	4107	10.4	3466	8.8	2186	212
11:09	4176	10.6	3402	8.6	2201	213

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
11:10	4192	10.6	3382	8.6	2281	221
11:11	4168	10.6	3405	8.6	2303	223
11:12	4160	10.6	3414	8.7	2273	220
11:13	4294	10.9	3289	8.3	2174	210
11:14	4365	11.1	3217	8.2	2198	213
11:15	4459	11.3	3126	7.9	2242	217
11:16	4476	11.4	3107	7.9	2309	224
11:17	4596	11.7	3000	7.6	2341	227
11:18	4648	11.8	2923	7.4	2269	220
11:19	4537	11.5	3017	7.7	2262	219
11:20	4380	11.1	3166	8.0	2287	222
11:21	4520	11.5	3031	7.7	2294	222
11:22	4358	11.1	3182	8.1	2363	229
11:23	4364	11.1	3180	8.1	2389	232
11:24	4367	11.1	3179	8.1	2281	221
11:25	4380	11.1	3163	8.0	2262	219
11:26	4432	11.2	3112	7.9	2312	224
11:27	4376	11.1	3167	8.0	2371	230
11:28	4355	11.0	3187	8.1	2386	231
11:29	4289	10.9	3254	8.3	2328	226
Avgs	**4110**	**10.4**	**3453**	**8.7**	**2313**	**224**

RUN DATA

Number 3

Client: **New Indy** | Project Number: **15730.001.009**
Location: **Catawba, SC** | Operator: **VD**
Source: **No. 1 Combination Boiler** | Calibration **1** | Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
With NCG's & SOG's						
12:07	4379	11.1	3140	8.0	2129	206
12:08	4421	11.2	3084	7.8	2062	199
12:09	4389	11.1	3111	7.9	2072	200
12:10	4406	11.2	3095	7.9	2087	202
12:11	4418	11.2	3085	7.8	2120	205
12:12	4388	11.1	3116	7.9	2242	217
12:13	4434	11.2	3076	7.8	2245	217
12:14	4516	11.5	2997	7.6	2229	216
12:15	4555	11.6	2962	7.5	2171	210
12:16	4586	11.6	2931	7.4	2049	198
12:17	4589	11.6	2927	7.4	2100	203
12:18	4526	11.5	2984	7.6	2295	222
12:19	4465	11.3	3038	7.7	2402	233
12:20	4480	11.4	3026	7.7	2266	220
12:21	4525	11.5	2993	7.6	2088	202
12:22	4583	11.6	2934	7.4	1951	188
12:23	4489	11.4	3016	7.7	1956	189
12:24	4401	11.2	3085	7.8	2015	195
12:25	4257	10.8	3210	8.1	2139	207
12:26	4255	10.8	3212	8.1	2247	218
12:27	4218	10.7	3245	8.2	2293	222
12:28	4255	10.8	3214	8.2	2251	218
12:29	4293	10.9	3180	8.1	2116	205
12:30	4342	11.0	3135	8.0	2040	197
12:31	4316	11.0	3159	8.0	2033	196
12:32	4264	10.8	3201	8.1	1980	191
12:33	4214	10.7	3246	8.2	2036	197
12:34	4206	10.7	3256	8.3	2056	199
12:35	4190	10.6	3269	8.3	2057	199
12:36	4166	10.6	3293	8.3	2103	203
12:37	4271	10.8	3193	8.1	2163	209
12:38	4281	10.9	3181	8.1	2266	220
12:39	4193	10.6	3265	8.3	2124	205
12:40	4153	10.5	3304	8.4	1870	180
12:41	4097	10.4	3355	8.5	1832	176
12:42	4114	10.4	3340	8.5	1876	181
12:43	4118	10.5	3332	8.4	1963	189
12:44	4092	10.4	3359	8.5	2148	208
12:45	4100	10.4	3358	8.5	2241	217
12:46	4163	10.6	3319	8.4	2036	197

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
12:47	4112	10.4	3367	8.5	1920	185
12:48	4076	10.3	3403	8.6	2027	196
12:49	4138	10.5	3365	8.5	2193	212
12:50	4095	10.4	3407	8.6	2301	223
12:51	4049	10.3	3451	8.7	2274	220
12:52	4024	10.2	3477	8.8	2207	214
12:53	4025	10.2	3483	8.8	2178	211
12:54	4016	10.2	3516	8.9	2153	208
12:55	3949	10.0	3582	9.1	2138	207
12:56	3928	10.0	3603	9.1	2072	200
12:57	3870	9.8	3660	9.3	2041	197
12:58	3960	10.1	3606	9.1	2053	198
12:59	4061	10.3	3549	9.0	2026	196
13:00	4041	10.3	3569	9.0	1988	192
13:01	4008	10.2	3603	9.1	1972	190
13:02	4063	10.3	3555	9.0	1925	186
13:03	4047	10.3	3569	9.0	1885	182
13:04	4029	10.2	3584	9.1	1881	181
13:05	4007	10.2	3604	9.1	1909	184
13:06	4143	10.5	3481	8.8	1890	182
Avgs	**4229**	**10.7**	**3278**	**8.3**	**2090**	**202**

BIAS
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 07:49

O_2
Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-41	0.0	0.0	0.0	Pass
Span	10.1	3961	10.1	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	29	0.1	0.0	0.0	Pass
Span	9.9	3898	9.9	0.0	0.0	Pass

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	117	6	5	0.5	Pass
Span	457	4543	446	-11	-1.2	Pass

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 09:45

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-26	0.1	0.1	0.5	Pass
Span	10.1	3974	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-26	0.1	0.1	0.5	Pass
Span	10.1	3974	10.1	0.0	0.0	Pass

*Bias No. 1

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	44	0.2	0.1	0.5	Pass
Span	9.9	3892	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.1	44	0.2	0.1	0.5	Pass
Span	9.9	3892	9.9	0.0	0.0	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 09:45

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	149	9	8	0.9	Pass
Span	457	4503	442	-15	-1.6	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	6	149	9	3	0.3	Pass
Span	446	4503	442	-4	-0.4	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 11:30

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	5	0.1	0.1	0.5	Pass
Span	10.1	3962	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.1	5	0.1	0.0	0.0	Pass
Span	10.1	3962	10.1	0.0	0.0	Pass

*Bias No. 2

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	68	0.2	0.1	0.5	Pass
Span	9.9	3869	9.8	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	68	0.2	0.0	0.0	Pass
Span	9.9	3869	9.8	-0.1	-0.5	Pass

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 3

Client: **New Indy** Project Number: **15730.001.009**
Location: **Catawba, SC** Operator: **VD**
Source: **No. 1 Combination Boiler** Calibration **1** Date: **13 Oct 2021**

Start Time: 11:30

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	130	7	6	0.7	Pass
Span	457	4548	446	-11	-1.2	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	9	130	7	-2	-0.2	Pass
Span	442	4548	446	4	0.4	Pass

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 13:10

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-44	0.0	0.0	0.0	Pass
Span	10.1	3947	10.0	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.1	-44	0.0	-0.1	-0.5	Pass
Span	10.1	3947	10.0	-0.1	-0.5	Pass

*Bias No. 3

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	38	0.2	0.1	0.5	Pass
Span	9.9	3842	9.7	-0.2	-1.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	38	0.2	0.0	0.0	Pass
Span	9.8	3842	9.7	-0.1	-0.5	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 13:10

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	108	5	4	0.4	Pass
Span	457	4570	448	-9	-1.0	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	7	108	5	-2	-0.2	Pass
Span	446	4570	448	2	0.2	Pass

*Bias No. 3

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 07:38

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	-38
10.1	EB0062273	3962
20.0	CC335419	7937

Curve Coefficients

Slope	Intercept	Corr. Coeff.
398.9	-53	>0.9999

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	32
10.2	EB0062273	3892
19.8	CC335419	7913

Curve Coefficients

Slope	Intercept	Corr. Coeff.
397.7	-27	0.9996

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 07:38

SO_2
Method: EPA 6C
Calibration Type: Linear Regression

Calibration Results

ppm	Cylinder ID	Result, mv
Zero	-	61
458	EB0108003	4654
911	CC259060	9230

Curve Coefficients

Slope	Intercept	Corr. Coeff.
10.07	55	>0.9999

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 07:38

O_2

Method: EPA 3A
Span Conc. 20.0 %
Slope 398.9 **Intercept** -52.9

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-38	0.0	0.0	0.0	Pass
10.1	3962	10.1	0.0	0.0	Pass
20.0	7937	20.0	0.0	0.0	Pass

CO_2

Method: EPA 3A
Span Conc. 19.8 %
Slope 397.7 **Intercept** -27.1

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	32	0.1	0.1	0.5	Pass
10.2	3892	9.9	-0.3	-1.5	Pass
19.8	7913	20.0	0.2	1.0	Pass

SO_2

Method: EPA 6C
Span Conc. 911 ppm
Slope 10.07 **Intercept** 55

Standard ppm	Response mv	Result ppm	Difference ppm	Error %	Status
Zero	61	1	1	0.1	Pass
458	4654	457	-1	-0.1	Pass
911	9230	911	0	0.0	Pass

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

File: C:\Data\211013 New Indy Catawba No. 1 Combination Boiler.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSTRLXX-PC **Trailer:** 88
Analog Input Device: MCC USB-1608G

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**20.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.8**

Channel 5

Analyte	**SO_2**
Method	**EPA 6C**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T100H SN410**
Full-Scale Output, mv	**10000**
Analyzer Range, ppm	**1000**
Span Concentration, ppm	**911**

NO. 1 COMBINATION BOILER
(CONDITION 2: NCG GASES ONLY)

New Indy
Catawba, SC

15730.001.009
No. 1 Combination Boiler
Condition 2: NCGs only

EMISSION CALCULATIONS

		Run 1	Run 2	Run 3	Mean
Date		**10/13/21**	**10/13/21**	**10/13/21**	---
Time Began		**1407**	**1544**	**1714**	---
Time Ended		**1507**	**1644**	**1814**	---
Volumetric Flow Rate, (Qs), DSCFM		1.37E+05	1.39E+05	1.43E+05	1.40E+05
BWS		0.174	0.176	0.162	0.170
% Oxygen		10.1	9.8	10.7	10.2
Sulfur Dioxide	MW= 64.06				
Concentration, ppm		140.0	176.0	180.0	165.3
Emission Rate, lb/hr		191.3	243.6	257.0	230.7

NIC PM and speciated TRS V2

New Indy
Catawba, SC

15730.001.009
No. 1 Combination Boiler

Condition 2: NCGs only

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		10/13/21	10/13/21	10/13/21	---
Time Began		1407	1544	1714	---
Time Ended		1526	1702	1831	---
INPUT DATA					
Sampling Time, min	(Theta)	64.0	64	64	64
Stack Diameter, in.	(Dia.)	120.00	120.00	120.00	120.00
Barometric Pressure, in. Hg	(Pb)	29.70	29.70	29.70	29.70
Static Pressure, in. H2O	(Pg)	-1.20	-1.20	-1.20	-1.20
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	1.0000	1.0000	1.0000	1.0000
Orifice Calibration Value	(Delta H@)	2.0490	2.0490	2.0490	2.0490
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	38.708	38.733	38.605	38.682
Meter Temperature, °F	(Tm)	88.4	83.2	84.9	85.5
Meter Temperature, °R	(Tm-R)	548.4	543.2	544.9	545.5
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	166.0	169.7	152.7	162.8
CO2 Concentration, %	(CO2)	9.6	9.9	8.9	9.5
O2 Concentration, %	(O2)	10.1	9.8	10.7	10.2
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.812	0.825	0.836	0.824
Stack Temperature, °F	(Ts)	446.6	449.9	443.8	446.8
Stack Temperature, °R	(Ts-R)	906.6	909.9	903.8	906.8
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	78.54	78.54	78.54	78.54
Stack Pressure, in. Hg	(Ps)	29.61	29.61	29.61	29.61
Meter Pressure, in. Hg	(Pm)	29.80	29.80	29.80	29.80
Standard Meter Volume, ft^3	(Vmstd)	37.100	37.478	37.235	37.271
Standard Water Volume, ft^3	(Vwstd)	7.814	7.988	7.188	7.663
Moisture Fraction (Measured)	(BWS)	0.174	0.176	0.162	0.170
Moisture Fraction (lower sat/meas)	(BWS)	0.174	0.176	0.162	0.170
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	29.94	29.98	29.85	29.92
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	27.86	27.87	27.93	27.89
Average Stack Gas Velocity, ft/sec	(Vs)	61.10	62.23	62.71	62.01
Stack Gas Flow, actual, ft^3/min	(Qa)	287939	293240	295532	292237
Stack Gas Flow, Std , ft^3/min	(Qs)	137035	138770	143175	139660
Calibration check	(Yqa)	0.9930	0.9871	0.9940	0.991
Percent difference from Y					-0.87%

NIC PM and speciated TRS V2

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	81	°F	
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.7	in. Hg	
Source	No. 1 Combination Boiler	Console ΔH@	2.05 (1.949 AB 10/26)	Static Pressure	-1.2	in. H_2O	
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	158.4	mL	
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	2.6	g	
Run Number	1 Con. 2	Pitot ID/Coeff.	P284 / 0.84				
Date	10-13-21	Thermo ID	AO25	Stack Area	78.54	ft^2	
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25 / 0.250 / 0.250 / 0.250				
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16		

K Factor	N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.002	0.000
@ Vac., in. Hg	15"	7"
Pitot	Good	Good

Filter ID N/A

Sample ID Run 1 Con. 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	14:07			857.54									
B A-1 D	4		.74	1.3	860.0	445	x	87	258	264	x	67	1.5	
2	8		.64	1.3	862.4	450	x	88	257	257	x	55	1.5	
3	12		.55	1.3	864.9	445	x	90	256	264	x	52	1.5	
4	16		.53	1.3	867.2	445	x	87	258	259	x	55	1.5	
A B-1	20		.77	1.3	869.6	447	x	91	259	260	x	64	1	
2	24		.72	1.3	872.1	446	x	89	260	261	x	60	1	
3	28		.53	1.3	874.5	444	x	89	260	263	x	60	1	
4	32		.52	1.3	876.9	443	x	90	259	263	x	61	1	
D C-1 B	36		.76	1.3	879.3	445	x	91	258	260	x	67	1	
2	40		.73	1.3	881.9	446	x	90	257	261	x	63	1	
3	44		.56	1.3	884.2	448	x	90	257	264	x	63	1	
4	48		.52	1.3	886.7	450	x	90	262	267	x	63	1	
C D-1	52		.81	1.3	889.1	444	x	86	261	263	x	65	1	
2	56		.78	1.3	891.4	449	x	84	266	267	x	59	1	
3	60		.74	1.3	893.8	449	x	88	257	268	x	57	1	
4	64	15:26	.71	1.3	896.249	450	x	84	260	266	x	58	1	
			Avg √Δp	Avg ΔH	Total Volume	Avg T_s		Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac	$V_{m\text{-}std}$
			.8110	1.300	38.708	446.625		88.375	256/266	257/268	X	67	1.5	scf
			.6631 (AB 10/26)	Avg √ΔH 1.1402										

*Barometric Pressure is at port elevation

WESTON SOLUTIONS® Integrated Air Services

Comments

Condition 2

Flue Gas Composition

Oxygen, %

Carbon Dioxide, %

Moisture, %

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run

Post-run

Thermocouple Check

Meter Temp., °F

Ref. Temp., °F

Result

Q_s, dscfm

% Isokinetic

Calculated by

QC by

15730.001.009 #1-2 CBs SO2 Emission Report

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	82	°F	
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.7	in. Hg	
Source	No. 1 Combination Boiler	Console ΔH@	2.05	Static Pressure	-1.2	in. H_2O	
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	157.8	mL	
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	11.9	g	
Run Number	2	Pitot ID/Coeff.	P284	0.84			
Date	10-13-21	Thermo ID	AO25	Stack Area	78.54	ft^2	
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25	0.250	0.250	0.250	
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16		

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.000	0.000
@ Vac., in. Hg	15"	7"
Pitot	Good	Good

Filter ID: N/A

Sample ID: Run 2 Con. 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	15:44			876.500									
A-1	4		.75	1.3	899.0	447	x	84	264	266	x	67	1	
2	8		.68	1.3	961.4	449	x	84	261	265	x	65	1	
3	12		.63	1.3	903.9	449	x	84	263	269	x	61	1	
4	16		.57	1.3	906.2	449	x	84	264	269	x	62	1	
B-1	20		.79	1.3	908.7	450	x	83	267	263	x	67	1	
2	24		.73	1.3	911.1	451	x	83	261	268	x	67	1	
3	28		.59	1.3	913.4	452	x	83	263	260	x	64	1	
4	32		.55	1.3	915.9	454	x	84	263	269	x	63	1	
C-1	36		.76	1.3	918.3	455	x	81	258	259	x	65	1.5	
2	40		.71	1.3	920.7	454	x	84	260	263	x	65	1.5	
3	44		.62	1.3	923.2	453	x	83	262	264	x	64	1.5	
4	48		.58	1.3	925.6	451	x	82	266	266	x	65	1.5	
D-1	52		.83	1.3	928.0	446	x	83	258	269	x	67	1.5	
2	56		.76	1.3	930.4	446	x	83	262	266	x	67	1.5	
3	60		.72	1.3	932.7	446	x	83	264	266	x	67	1.5	
4	64	17:02	.67	1.3	935.233	446	x	83	262	266	x	67	1.5	
			Avg $\sqrt{\Delta p}$	Avg ΔH	Total Volume	Avg T_s		Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac	$V_{m\text{-}std}$
			.8253	1.300	38.733	449.75		83.188	258/266	259/269	X	67	1.5	scf
			.6838	Avg $\sqrt{\Delta H}$ 1.1402										

*Barometric Pressure is at port elevation

Flue Gas Composition

Oxygen, %

Carbon Dioxide, %

Moisture, %

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run

Post-run

Thermocouple Check

Meter Temp., °F

Ref. Temp., °F

Result

Q_s, dscfm

% Isokinetic

Calculated by

QC by

Comments

Condition 2

WESTON SOLUTIONS® Integrated Air Services

15730.001.009 #1-2 CBs SO_2 Emission Report

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	82	°F	
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.7	in. Hg	
Source	No. 1 Combination Boiler	Console ΔH@	2.0549	Static Pressure	-1.2	in. H_2O	
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	143.5	mL	
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	9.2	g	
Run Number	3	Pitot ID/Coeff.	P284 / 0.84				
Date	10-13-21	Thermo ID	AO25	Stack Area	78.54	ft^2	
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25 / 0.250 / 0.250 / 0.250				
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16		

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.001	0.000
@ Vac., in. Hg	15"	7"
Pitot	Good	Good

Filter ID: N/A

Sample ID: Run 3 Con. 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	17:14			935.400									
A-1	4		.80	1.3	937.6	440	x	84	264	263	x	67	1.5	
2	8		.76	1.3	940.3	451	x	84	260	266	x	67	1.5	
3	12		.67	1.3	942.6	450	x	84	264	268	x	63	1.5	
4	16		.60	1.3	945.0	449	x	84	259	264	x	60	1.5	
B-1	20		.77	1.3	947.4	446	x	84	261	268	x	65	1.5	
2	24		.72	1.3	947.8	445	x	84	257	266	x	57	1.5	
3	28		.63	1.3	952.2	444	x	85	258	261	x	55	1.5	
4	32		.58	1.3	954.6	444	x	85	261	264	x	55	1.5	
C-1	36		.79	1.3	957.1	441	x	84	260	266	x	60	1.5	
2	40		.71	1.3	959.5	441	x	85	263	269	x	57	1.5	
3	44		.66	1.3	961.9	441	x	85	262	267	x	55	1.5	
4	48		.61	1.3	964.3	441	x	86	263	263	x	54	1.5	
D-1	52		.83	1.3	966.7	441	x	87	261	259	x	63	1.5	
2	56		.73	1.3	969.1	442	x	86	254	258	x	62	1.5	
3	60		.69	1.3	971.6	442	x	86	260	262	x	58	1.5	
4	64	18:31	.65	1.3	974.005	442	x	86	255	263	x	60	1.5	
			Avg √Δp	Avg ΔH	Total Volume	Avg T_s		Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac	$V_{m\text{-}std}$, scf
			.8355	1.300	38.605	443.75		84.9375	254/264	258/269	X	67	1.5	
			.7000	Avg √ΔH										
				1.1402										

*Barometric Pressure is at port elevation

WESTON SOLUTIONS® Integrated Air Services

Comments _____

Flue Gas Composition

Oxygen, % _____

Carbon Dioxide, % _____

Moisture, % _____

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run _____

Post-run _____

Thermocouple Check

Meter Temp., °F _____

Ref. Temp., °F _____

Result _____

Q_s, dscfm _____

% Isokinetic _____

Calculated by _____

QC by _____

Condition 2

15730.001.009 #1-2 CBs SO2 Emission Report

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 1 Combination Boiler
W.O. Number: 15730.001.009

Impingers 1 - 3 measurements in **grams**

Run No. 1 | Sample Date 10-13-21 | Recovery Date 10-13-21
Sample ID | Filter ID | Analyst RS

	Impingers 1	2	3		Imp. Total	Silica Gel grams	Total
Contents							
Final	884.6	701.9	539.1			810.1	
Initial	751.4	680.7	535.1			802.5	
Gain	133.2	21.2	4.0		158.4	7.6	166

Impinger Color: good | Labled? ✓
Silica Gel Condition: good | Sealed? ✓

Run No. 2 | Sample Date 10-13-21 | Recovery Date 10-13-21
Sample ID | Filter ID | Analyst RS

	Impingers 1	2	3		Imp. Total	Silica Gel grams	Total
Contents							
Final	898.4	722.0	542.3			828.0	
Initial	763.9	701.9	539.1			816.1	
Gain	134.5	20.1	3.2		157.8	11.9	169.7

Impinger Color: clear | Labled? ✓
Silica Gel Condition: good | Sealed? ✓

Run No. 3 | Sample Date 10-13-21 | Recovery Date 10-13-21
Sample ID | Filter ID | Analyst RS

	Impingers 1	2	3		Imp. Total	Silica Gel grams	Total
Contents							
Final	900.4	701.6	545.2			837.2	
Initial	779.2	682.2	542.3			828.0	
Gain	121.2	19.4	2.9		143.5	9.2	152.7

Impinger Color: Clear | Labled? ✓
Silica Gel Condition: Good | Sealed? ✓

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS
Integrated Air Services

RUN SUMMARY

Number 4

Client: **New Indy** | Project Number: **15730.001.009**
Location: **Catawba, SC** | Operator: **VD**
Source: **No. 1 Combination Boiler** | Calibration **1** | Date: **13 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 14:07 to 15:07

Run Averages

	10.0	9.3	141

Pre-run Bias at 13:10

Zero Bias	0.0	0.2	5
Span Bias	10.0	9.7	448
Span Gas	10.1	10.2	458

Post-run Bias at 15:09

Zero Bias	0.0	0.2	7
Span Bias	10.0	9.8	445
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

	10.1	9.6	140

RUN SUMMARY

Number 5

Client: **New Indy** | Project Number: **15730.001.009**
Location: **Catawba, SC** | Operator: **VD**
Source: **No. 1 Combination Boiler** | Calibration **1** | Date: **13 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 15:44 to 16:44

Run Averages

	9.7	9.6	176

Pre-run Bias at 15:09

Zero Bias	0.0	0.2	7
Span Bias	10.0	9.8	445
Span Gas	10.1	10.2	458

Post-run Bias at 16:45

Zero Bias	0.0	0.2	9
Span Bias	10.0	9.9	444
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

9.8 ✓	9.9 ✓	176 ✓

RUN SUMMARY

Number 6

Client: **New Indy** | Project Number: **15730.001.009**
Location: **Catawba, SC** | Operator: **VD**
Source: **No. 1 Combination Boiler** | Calibration **1** | Date: **13 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 17:14 to 18:14

Run Averages

	10.5	8.7	182

Pre-run Bias at 16:45

Zero Bias	0.0	0.2	9
Span Bias	10.0	9.9	444
Span Gas	10.1	10.2	458

Post-run Bias at 18:17

Zero Bias	0.0	0.2	6
Span Bias	10.0	9.9	456
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

	10.7	8.9	180

RUN DATA

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
With NCG's						
14:08	3832	9.7	3669	9.3	1350	129
14:09	3786	9.6	3720	9.4	1344	128
14:10	3822	9.7	3713	9.4	1351	129
14:11	3837	9.8	3716	9.4	1344	128
14:12	3914	9.9	3687	9.3	1478	141
14:13	3859	9.8	3744	9.5	1478	141
14:14	3761	9.6	3843	9.7	1192	113
14:15	3764	9.6	3838	9.7	1056	99
14:16	3679	9.4	3920	9.9	1015	95
14:17	3660	9.3	3940	10.0	1085	102
14:18	3647	9.3	3957	10.0	1132	107
14:19	3770	9.6	3837	9.7	1067	100
14:20	3795	9.6	3812	9.7	1151	109
14:21	3890	9.9	3723	9.4	1337	127
14:22	3870	9.8	3748	9.5	1367	130
14:23	3923	10.0	3694	9.4	1385	132
14:24	4012	10.2	3603	9.1	1483	142
14:25	4047	10.3	3575	9.1	1591	153
14:26	4176	10.6	3453	8.8	1674	161
14:27	4288	10.9	3346	8.5	1750	168
14:28	4203	10.7	3396	8.6	1707	164
14:29	4230	10.7	3354	8.5	1777	171
14:30	4092	10.4	3479	8.8	1800	173
14:31	4119	10.5	3462	8.8	1719	165
14:32	4149	10.5	3433	8.7	1669	160
14:33	4164	10.6	3415	8.7	1681	161
14:34	4237	10.8	3345	8.5	1700	163
14:35	4247	10.8	3336	8.5	1768	170
14:36	4248	10.8	3333	8.4	1746	168
14:37	4212	10.7	3368	8.5	1511	145
14:38	4175	10.6	3403	8.6	1533	147
14:39	4141	10.5	3438	8.7	1541	148
14:40	4107	10.4	3472	8.8	1273	121
14:41	4041	10.3	3530	8.9	1399	133
14:42	3896	9.9	3669	9.3	1522	146
14:43	3902	9.9	3666	9.3	1495	143
14:44	3916	9.9	3653	9.3	1361	130
14:45	3910	9.9	3660	9.3	1447	138
14:46	3863	9.8	3699	9.4	1556	149
14:47	3813	9.7	3747	9.5	1605	154

RUN DATA

Number 4

Client: **New Indy** Project Number: **15730.001.009**
Location: **Catawba, SC** Operator: **VD**
Source: **No. 1 Combination Boiler** Calibration **1** Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
14:48	3748	9.5	3810	9.6	1617	155
14:49	3830	9.7	3735	9.5	1603	154
14:50	3805	9.7	3759	9.5	1617	155
14:51	3747	9.5	3810	9.6	1610	154
14:52	3859	9.8	3712	9.4	1591	153
14:53	3824	9.7	3744	9.5	1590	152
14:54	3865	9.8	3705	9.4	1571	151
14:55	3893	9.9	3677	9.3	1500	143
14:56	3872	9.8	3697	9.4	1530	146
14:57	3804	9.7	3760	9.5	1527	146
14:58	3818	9.7	3745	9.5	1509	144
14:59	3788	9.6	3778	9.6	1524	146
15:00	3806	9.7	3762	9.5	1500	143
15:01	3864	9.8	3709	9.4	1437	137
15:02	3759	9.6	3808	9.6	1385	132
15:03	3745	9.5	3820	9.7	1373	131
15:04	3751	9.5	3816	9.7	1369	130
15:05	3769	9.6	3800	9.6	1395	133
15:06	3821	9.7	3751	9.5	1414	135
15:07	3816	9.7	3753	9.5	1396	133
Avgs	**3920**	**10.0**	**3659**	**9.3**	**1475**	**141**

RUN DATA

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
15:45	3892	9.9	3697	9.4	1913	185
15:46	3816	9.7	3764	9.5	1980	191
15:47	3793	9.6	3787	9.6	2025	196
15:48	3790	9.6	3793	9.6	2074	201
15:49	3848	9.8	3740	9.5	1983	191
15:50	3839	9.8	3747	9.5	1955	189
15:51	3822	9.7	3764	9.5	1922	185
15:52	3827	9.7	3757	9.5	1929	186
15:53	3922	10.0	3668	9.3	1938	187
15:54	3946	10.0	3641	9.2	1948	188
15:55	3987	10.1	3603	9.1	1934	187
15:56	3940	10.0	3646	9.2	1979	191
15:57	3891	9.9	3698	9.4	2018	195
15:58	3790	9.6	3794	9.6	1992	192
15:59	3698	9.4	3880	9.8	2025	196
16:00	3660	9.3	3914	9.9	2036	197
16:01	3609	9.2	3960	10.0	2088	202
16:02	3584	9.1	3988	10.1	2046	198
16:03	3562	9.1	4010	10.2	2115	205
16:04	3600	9.2	3972	10.1	2066	200
16:05	3552	9.0	4016	10.2	1993	192
16:06	3514	8.9	4054	10.3	1959	189
16:07	3536	9.0	4032	10.2	1996	193
16:08	3553	9.0	4013	10.2	1980	191
16:09	3580	9.1	3990	10.1	1965	190
16:10	3540	9.0	4030	10.2	1914	185
16:11	3499	8.9	4083	10.3	1904	184
16:12	3625	9.2	4016	10.2	1860	179
16:13	3654	9.3	3998	10.1	1793	173
16:14	3651	9.3	3999	10.1	1772	171
16:15	3576	9.1	4072	10.3	1746	168
16:16	3530	9.0	4116	10.4	1760	169
16:17	3471	8.8	4176	10.6	1738	167
16:18	3515	8.9	4134	10.5	1712	165
16:19	3551	9.0	4101	10.4	1691	162
16:20	3655	9.3	4004	10.1	1655	159
16:21	3772	9.6	3892	9.9	1591	153
16:22	3734	9.5	3929	9.9	1598	153
16:23	3765	9.6	3908	9.9	1583	152
16:24	3840	9.8	3832	9.7	1540	147
16:25	3852	9.8	3818	9.7	1593	153

RUN DATA

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
16:26	3996	10.1	3682	9.3	1654	159
16:27	4017	10.2	3656	9.3	1656	159
16:28	4062	10.3	3613	9.2	1659	159
16:29	4119	10.5	3556	9.0	1698	163
16:30	4062	10.3	3580	9.1	1721	165
16:31	3889	9.9	3705	9.4	1754	169
16:32	3903	9.9	3689	9.3	1756	169
16:33	4016	10.2	3582	9.1	1760	169
16:34	4122	10.5	3479	8.8	1737	167
16:35	4106	10.4	3490	8.8	1712	165
16:36	4121	10.5	3475	8.8	1727	166
16:37	4015	10.2	3577	9.1	1723	166
16:38	4102	10.4	3496	8.9	1706	164
16:39	4188	10.6	3415	8.7	1703	164
16:40	4193	10.6	3404	8.6	1701	163
16:41	4252	10.8	3353	8.5	1665	160
16:42	4203	10.7	3378	8.6	1684	162
16:43	4155	10.5	3410	8.6	1671	160
16:44	3952	10.0	3603	9.1	1622	156
Avgs	**3821**	**9.7**	**3786**	**9.6**	**1827**	**176**

RUN DATA

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
17:15	4204	10.7	3370	8.5	1719	165
17:16	4217	10.7	3362	8.5	1703	164
17:17	4375	11.1	3216	8.2	1686	162
17:18	4421	11.2	3170	8.0	1744	168
17:19	4387	11.1	3201	8.1	1796	173
17:20	4265	10.8	3317	8.4	1796	173
17:21	4239	10.8	3340	8.5	1786	172
17:22	4175	10.6	3399	8.6	1784	172
17:23	4174	10.6	3393	8.6	1829	176
17:24	4143	10.5	3421	8.7	1818	175
17:25	4122	10.5	3438	8.7	1856	179
17:26	4075	10.3	3477	8.8	1889	182
17:27	4098	10.4	3460	8.8	1888	182
17:28	4228	10.7	3335	8.5	1901	183
17:29	4213	10.7	3345	8.5	1901	183
17:30	4195	10.6	3362	8.5	1879	181
17:31	4190	10.6	3366	8.5	1861	179
17:32	4142	10.5	3412	8.6	1911	184
17:33	4140	10.5	3414	8.7	1907	184
17:34	4152	10.5	3405	8.6	1867	180
17:35	4222	10.7	3338	8.5	1888	182
17:36	4094	10.4	3459	8.8	1950	188
17:37	4114	10.4	3448	8.7	1912	184
17:38	4207	10.7	3357	8.5	1884	182
17:39	4227	10.7	3336	8.5	1900	183
17:40	4229	10.7	3334	8.5	1900	183
17:41	4198	10.7	3364	8.5	1943	187
17:42	4210	10.7	3353	8.5	1929	186
17:43	4144	10.5	3415	8.7	1911	184
17:44	4206	10.7	3355	8.5	1960	189
17:45	4183	10.6	3376	8.6	1973	190
17:46	4126	10.5	3429	8.7	1938	187
17:47	4037	10.3	3512	8.9	1945	188
17:48	4102	10.4	3455	8.8	1926	186
17:49	4136	10.5	3424	8.7	1918	185
17:50	4127	10.5	3430	8.7	1894	183
17:51	4085	10.4	3472	8.8	1936	187
17:52	4008	10.2	3548	9.0	1945	188
17:53	3995	10.1	3560	9.0	1950	188
17:54	4081	10.4	3488	8.8	1896	183
17:55	4092	10.4	3468	8.8	1899	183

RUN DATA

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
17:56	4040	10.3	3517	8.9	1897	183
17:57	4039	10.3	3522	8.9	1858	179
17:58	4016	10.2	3543	9.0	1893	183
17:59	4000	10.2	3561	9.0	1896	183
18:00	4058	10.3	3506	8.9	1865	180
18:01	4151	10.5	3417	8.7	1845	178
18:02	4239	10.8	3336	8.5	1862	179
18:03	4211	10.7	3356	8.5	1860	179
18:04	4188	10.6	3380	8.6	1888	182
18:05	4180	10.6	3388	8.6	1887	182
18:06	4281	10.9	3293	8.3	1870	180
18:07	4157	10.6	3408	8.6	1902	183
18:08	4051	10.3	3512	8.9	1952	188
18:09	3972	10.1	3586	9.1	1933	187
18:10	4044	10.3	3524	8.9	1964	190
18:11	4040	10.3	3530	8.9	1993	192
18:12	4162	10.6	3410	8.6	1950	188
18:13	4018	10.2	3544	9.0	1957	189
18:14	3953	10.0	3607	9.1	1996	193
Avgs	**4146**	**10.5**	**3418**	**8.7**	**1886**	**182**

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 13:10

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-44	0.0	0.0	0.0	Pass
Span	10.1	3947	10.0	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.1	-44	0.0	-0.1	-0.5	Pass
Span	10.1	3947	10.0	-0.1	-0.5	Pass

*Bias No. 3

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	38	0.2	0.1	0.5	Pass
Span	9.9	3842	9.7	-0.2	-1.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	38	0.2	0.0	0.0	Pass
Span	9.8	3842	9.7	-0.1	-0.5	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 13:10

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	108	5	4	0.4	Pass
Span	457	4570	448	-9	-1.0	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	7	108	5	-2	-0.2	Pass
Span	446	4570	448	2	0.2	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 15:09

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-46	0.0	0.0	0.0	Pass
Span	10.1	3944	10.0	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-46	0.0	0.0	0.0	Pass
Span	10.0	3944	10.0	0.0	0.0	Pass

*Bias No. 4

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	69	0.2	0.1	0.5	Pass
Span	9.9	3888	9.8	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	69	0.2	0.0	0.0	Pass
Span	9.7	3888	9.8	0.1	0.5	Pass

*Bias No. 4

BIAS AND CALIBRATION DRIFT

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 15:09

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	130	7	6	0.7 ✓	Pass
Span	457	4538	445	-12	-1.3 ✓	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	5	130	7	2	0.2 ✓	Pass
Span	448	4538	445	-3	-0.3 ✓	Pass

*Bias No. 4

BIAS AND CALIBRATION DRIFT

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 16:45

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-53	0.0	0.0	0.0	Pass
Span	10.1	3948	10.0	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-53	0.0	0.0	0.0	Pass
Span	10.0	3948	10.0	0.0	0.0	Pass

*Bias No. 5

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	66	0.2	0.1	0.5	Pass
Span	9.9	3891	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	66	0.2	0.0	0.0	Pass
Span	9.8	3891	9.9	0.1	0.5	Pass

*Bias No. 5

BIAS AND CALIBRATION DRIFT

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 16:45

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	149	9	8	0.9	Pass
Span	457	4529	444	-13	-1.4	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	7	149	9	2	0.2	Pass
Span	445	4529	444	-1	-0.1	Pass

*Bias No. 5

BIAS AND CALIBRATION DRIFT

Number 7

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 18:17

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-65	0.0	0.0	0.0	Pass
Span	10.1	3943	10.0	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-65	0.0	0.0	0.0	Pass
Span	10.0	3943	10.0	0.0	0.0	Pass

*Bias No. 6

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	68	0.2	0.1	0.5	Pass
Span	9.9	3929	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	68	0.2	0.0	0.0	Pass
Span	9.9	3929	9.9	0.0	0.0	Pass

*Bias No. 6

BIAS AND CALIBRATION DRIFT

Number 7

Client: **New Indy** Project Number: **15730.001.009**
Location: **Catawba, SC** Operator: **VD**
Source: **No. 1 Combination Boiler** Calibration **1** Date: **13 Oct 2021**

Start Time: 18:17

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %		Status
Zero	1	115	6	5	0.5	✓	Pass
Span	457	4650	456	-1	-0.1	✓	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %		Status
Zero	9	115	6	-3	-0.3	✓	Pass
Span	444	4650	456	12	1.3	✓	Pass

*Bias No. 6

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 07:38

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	-38
10.1	EB0062273	3962
20.0	CC335419	7937

Curve Coefficients

Slope	Intercept	Corr. Coeff.
398.9	-53	>0.9999

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	32
10.2	EB0062273	3892
19.8	CC335419	7913

Curve Coefficients

Slope	Intercept	Corr. Coeff.
397.7	-27	0.9996

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 07:38

SO_2
Method: EPA 6C
Calibration Type: Linear Regression

Calibration Results

ppm	Cylinder ID	Result, mv
Zero	-	61
458	EB0108003	4654
911	CC259060	9230

Curve Coefficients

Slope	Intercept	Corr. Coeff.
10.07	55	>0.9999

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 07:38

O_2

Method: EPA 3A
Span Conc. 20.0 %
Slope 398.9 **Intercept** -52.9

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-38	0.0	0.0	0.0	Pass
10.1	3962	10.1	0.0	0.0	Pass
20.0	7937	20.0	0.0	0.0	Pass

CO_2

Method: EPA 3A
Span Conc. 19.8 %
Slope 397.7 **Intercept** -27.1

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	32	0.1	0.1	0.5	Pass
10.2	3892	9.9	-0.3	-1.5	Pass
19.8	7913	20.0	0.2	1.0	Pass

SO_2

Method: EPA 6C
Span Conc. 911 ppm
Slope 10.07 **Intercept** 55

Standard ppm	Response mv	Result ppm	Difference ppm	Error %	Status
Zero	61	1	1	0.1	Pass
458	4654	457	-1	-0.1	Pass
911	9230	911	0	0.0	Pass

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

File: C:\Data\211013 New Indy Catawba No. 1 Combination Boiler.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSTRLXX-PC **Trailer:** 88
Analog Input Device: MCC USB-1608G

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**20.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.8**

Channel 5

Analyte	**SO_2**
Method	**EPA 6C**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T100H SN410**
Full-Scale Output, mv	**10000**
Analyzer Range, ppm	**1000**
Span Concentration, ppm	**911**

NO. 2 COMBINATION BOILER
(CONDITION 1: NCG AND SOG GASES)

New Indy
Catawba, SC

15730.001.009
No. 2 Combination Boiler
Condition 1: NCGs & SOGs

EMISSION CALCULATIONS

		Run 1	Run 2	Run 3	Mean
Date		**10/14/21**	**10/14/21**	**10/14/21**	---
Time Began		**830**	**1026**	**1222**	---
Time Ended		**930**	**1126**	**1322**	---
Volumetric Flow Rate, (Qs), DSCFM		1.40E+05	1.43E+05	1.35E+05	1.39E+05
BWS		0.168	0.194	0.160	0.174
% Oxygen		10.8	10.1	11.5	10.8
Sulfur Dioxide	MW= 64.06				
Concentration, ppm		275.0	262.0	286.0	274.3
Emission Rate, lb/hr		383.7	373.7	385.4	380.9

AB

NIC PM and speciated TRS V2

New Indy
Catawba, SC

15730.001.009
No. 2 Combination Boiler

Condition 1: NCGs & SOGs

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		10/14/21	10/14/21	10/14/21	---
Time Began		840	1026	1218	---
Time Ended		955	1146	1340	---
INPUT DATA					
Sampling Time, min	(Theta)	64.0	64	64	64
Stack Diameter, in.	(Dia.)	120.00	120.00	120.00	120.00
Barometric Pressure, in. Hg	(Pb)	29.65	29.65	29.65	29.65
Static Pressure, in. H2O	(Pg)	-1.10	-1.10	-1.10	-1.10
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	1.0000	1.0000	1.0000	1.0000
Orifice Calibration Value	(Delta H@)	2.0490	2.0490	2.0490	2.0490
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	38.399	38.625	39.255	38.760
Meter Temperature, °F	(Tm)	75.1	93.3	96.6	88.3
Meter Temperature, °R	(Tm-R)	535.1	553.3	556.6	548.3
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	161.9	186.9	149.7	166.2
CO2 Concentration, %	(CO2)	8.2	9.5	7.5	8.4
O2 Concentration, %	(O2)	10.8	10.1	11.5	10.8
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.830	0.879	0.795	0.835
Stack Temperature, °F	(Ts)	463.4	477.3	465.4	468.7
Stack Temperature, °R	(Ts-R)	923.4	937.3	925.4	928.7
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	78.54	78.54	78.54	78.54
Stack Pressure, in. Hg	(Ps)	29.57	29.57	29.57	29.57
Meter Pressure, in. Hg	(Pm)	29.75	29.75	29.75	29.75
Standard Meter Volume, ft^3	(Vmstd)	37.652	36.633	37.004	37.096
Standard Water Volume, ft^3	(Vwstd)	7.621	8.797	7.046	7.821
Moisture Fraction (Measured)	(BWS)	0.168	0.194	0.160	0.174
Moisture Fraction (lower sat/meas)	(BWS)	0.168	0.194	0.160	0.174
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	29.74	29.92	29.66	29.78
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	27.77	27.61	27.79	27.73
Average Stack Gas Velocity, ft/sec	(Vs)	63.20	67.63	60.56	63.79
Stack Gas Flow, actual, ft^3/min	(Qa)	297803	318693	285372	300623
Stack Gas Flow, Std , ft^3/min	(Qs)	139897	143007	135114	139339
Calibration check	(Yqa)	0.9929	1.0006	0.9920	0.995
Percent difference from Y					-0.48%

NIC PM and speciated TRS V2

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	63 °F	K Factor	N/A
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.65 in. Hg → BAR-14		
Source	No. 2 Combination Boiler	Console ΔH@	2.0549 AR 10/26/21	Static Pressure	-1.1 in. H_2O		
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	150.5 mL		
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	11.4 g		
Run Number	1	Pitot ID/Coeff.	P284 / 0.84				
Date	10-14-21	Thermo ID	AO25	Stack Area	78.54 ft^2		
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25 / 0.250 / 0.250 / 0.250				
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16		

Leak Checks

	Initial	Final
Volume, ft^3	0.003	0.000
@ Vac., in. Hg	15	4"
Pitot	good	good

Filter ID N/A

Sample ID N/A

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	8:40			474.050									
A-1	4		.80	1.3	476.5	460	x	68	260	252	x	66	1	
2	8		.86	1.3	478.7	462	x	68	255	255	x	54	1	
3	12		.85	1.3	981.2	462	x	69	260	258	x	53	1	
4	16		.72	1.3	983.5	460	x	69	261	258	x	53	1	
B-1	20		.79	1.3	985.9	463	x	72	262	255	x	57	1	
2	24		.84	1.3	488.4	463	x	72	258	254	x	57	1	
3	28		.85	1.3	990.8	462	x	72	259	257	x	57	1	
4	32		.74	1.3	993.1	463	x	75	261	257	x	58	1	
C-1	36		.70	1.3	995.7	462	x	76	263	255	x	63	1	
2	40		.59	1.3	998.0	464	x	77	264	252	x	58	1	
3	44		.54	1.3	000.4	464	x	78	261	257	x	58	1	
4	48		.50	1.3	2.8	463	x	78	257	254	x	58	1	
D-1	52		.73	1.3	5.2	466	x	81	255	255	x	60	1	
2	56		.61	1.3	7.7	467	x	81	257	256	x	60	1	
3	60		.51	1.3	10.0	467	x	83	255	256	x	63	1	
4	64	9:55	.49	1.3	12.441	467	x	83	254	255	x	64	1	
			Avg √Δp .6950	Avg ΔH 1.3	Total Volume 38.399	Avg T_s 463.484		Avg T_m 75.12	Min/Max 254/264	Min/Max 252/258	Min/Max	Max Temp 65	Max Vac 1	

*Barometric Pressure is at port elevation

√Δp = .8294 ✓ Avg √ΔH 1.1402 ✓ AR 10/26/21

$V_{m\text{-}std}$ scf

Q_s, dscfm

% Isokinetic

Calculated by

QC by AM

Flue Gas Composition

Oxygen, %

Carbon Dioxide, %

Moisture, %

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run

Post-run

Thermocouple Check

Meter Temp., °F

Ref. Temp., °F

Result

Comments AR 10/26/21

WESTON SOLUTIONS® Integrated Air Services

15730.001.009 #1-2 CBs SO2 Emission Report

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	73 °F	K Factor	N/A
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.65 in. Hg → BAR -14		
Source	No. 2 Combination Boiler	Console ΔH@	2.05 1.49 AB 10/24	Static Pressure	-1.1 in. H_2O		
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	127.8 mL		
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	9.1 g		
Run Number	2	Pitot ID/Coeff.	P284 / 0.84				
Date	10.14.21	Thermo ID	AO25	Stack Area	78.54 ft^2		
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25 / 0.250 / 0.250 / 0.250				
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16		

Leak Checks

	Initial	Final
Volume, ft^3	0.000	0.000
@ Vac., in. Hg	15"	4"
Pitot	good	good

Filter ID N/A

Sample ID N/A

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	10:26			12.575									
A-1	4		.90	1.3	14.9	482	x	90	254	252	x	63	1	
2	8		.89	1.3	17.4	479	x	90	255	254	x	58	1	
3	12		.86	1.3	19.8	478	x	91	254	255	x	57	1	
4	16		.74	1.3	22.2	478	x	92	255	254	x	58	1	
B-1	20		.90	1.3	24.7	476	x	92	253	257	x	60	1	
2	24		.95	1.3	27.1	475	x	93	254	256	x	61	1	
3	28		.94	1.3	29.7	478	x	93	254	256	x	61	1	
4	32		.82 .47 RS	1.3	31.9	477	x	93	255	255	x	63	1	
C-1	36		.82	1.3	34.3	468	x	93	254	255	x	63	1	
2	40		.76	1.3	36.7	473	x	94	254	255	x	64	1	
3	44		.58	1.3	39.1	476	x	94	255	256	x	64	1	
4	48		.54	1.3	41.6	474	x	94	255	256	x	65	2	
D-1	52		.87	1.3	44.0	475	x	95	255	254	x	65	2	
2	56		.75	1.3	46.5	482	x	96	257	253	x	65	2	
3	60		.64	1.3	48.8	481	x	96	256	254	x	65	2	
4	64	11:46	.56	1.3	51.200	482	x	96	256	251	x	65	2	
			Avg √Δp .87899	Avg ΔH 1.3	Total Volume 38.625	Avg T_s 477.13		Avg T_m 43.25	Min/Max 253/257	Min/Max 251/251	Min/Max	Max Temp 65	Max Vac 2	

*Barometric Pressure is at port elevation

Avg Δ P = .77878

Avg √ΔH 1.1407

Comments AB 10/24

AB 10/24

Flue Gas Composition

Oxygen, %

Carbon Dioxide, %

Moisture, %

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run

Post-run

Thermocouple Check

Meter Temp., °F

Ref. Temp., °F

Result

$V_{m\text{-}std}$, scf

Q_s, dscfm

% Isokinetic

Calculated by

QC by AW

WESTON SOLUTIONS® Integrated Air Services

15730.001.009 #1-2 CBs SO_2 Emission Report

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	80	°F	
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.65	in. Hg	
Source	No. 2 Combination Boiler	Console ΔH@	2.05	Static Pressure	-1.1	in. H_2O	
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	139.9	mL	
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	9.8	g	
Run Number	3	Pitot ID/Coeff.	P284 / 0.84				
Date	10-14-21	Thermo ID	AO25	Stack Area	78.54	ft^2	
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25 / 0.250 / 0.250 / 0.250				
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16		

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.004	0.006
@ Vac., in. Hg	15"	5"
Pitot	good	good

Filter ID: N/A

Sample ID: N/A

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	12:18			57.520									
C A-1	4		.62	1.3	54.0	473	x	96	254	255	x	64	1	
2	8		.54	1.3	56.4	474	x	96	254	255	x	64	1	
3	12		.51	1.3	59.0	477	x	96	255	255	x	59	1	
4	16		.50	1.3	61.3	462	x	98	254	255	x	59	1	
B-1	20		.78	1.3	63.8	462	x	98	253	254	x	58	1	
2	24		.82	1.3	66.3	465	x	98	251	254	x	58	1	
3	28		.77	1.3	68.7	464	x	96	257	255	x	56	1	
4	32		.74	1.3	71.1	462	x	96	255	254	x	57	1	
A-1	36		.74	1.3	73.7	461	x	96	255	254	x	62	1	
2	40		.71	1.3	76.1	464	x	96	255	256	x	60	1	
3	44		.70	1.3	78.5	463	x	96	254	254	x	60	1	
4	48		.66	1.3	81.0	462	x	96	255	254	x	60	1	
D-1	52		.68	1.3	83.4	464	x	97	255	254	x	64	1	
2	56		.53	1.3	85.9	461	x	97	254	254	x	64	1	
3	60		.47	1.3	88.4	465	x	97	255	254	x	65	1	
4	64	13:40	.43	1.3	90.775	462	x	97	255	254	x	65	1	
			Avg √Δp	Avg ΔH	Total Volume	Avg T_s		Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac	
			.7947	1.3	39.255	465.44		96.625	251/257	254/256		65	1	

*Barometric Pressure is at port elevation

Avg ΔP = .6375

Avg √ΔH = 1.1402

$V_{m\text{-}std}$ scf

Q_s, dscfm

% Isokinetic

Calculated by

QC by

Flue Gas Composition

Oxygen, %

Carbon Dioxide, %

Moisture, %

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run

Post-run

Thermocouple Check

Meter Temp., °F

Ref. Temp., °F

Result

Comments

WESTON SOLUTIONS
Integrated Air Services

15730.001.009 #1-2 CBs SO_2 Emission Report

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 2 Combination Boiler
W.O. Number: 15730.001.009

Impingers 1 - 3 measurements in **grams**

Run No. 1 | Sample Date 10-14-21 | Recovery Date 10-14-21
Sample ID | Filter ID N/A | Analyst RS

	Impingers 1	2	3		Imp.Total	Silica Gel grams	Total
Contents							
Final	795.4	763.0	567.4			806.9	
Initial	757.1	673.0	545.2			795.5	
Gain	~~795.~~ 38.3	90	~~567.4~~ 222		150.5	11.4	161.9

Impinger Color: clear | Labled? ✓
Silica Gel Condition: Good | Sealed? ✓

Run No. 2 | Sample Date 10-14-21 | Recovery Date 10/14-21
Sample ID | Filter ID N/A | Analyst RS

	Impingers 1	2	3		Imp.Total	Silica Gel grams	Total
Contents							
Final	910.8	729.9	540.0			816.0	
Initial	763.0	703.1	536.8			806.9	
Gain	147.8	26.8	3.2		177.8	9.1	186.9

Impinger Color | Labled? ✓
Silica Gel Condition | Sealed?

Run No. 3 | Sample Date 10-14-21 | Recovery Date 10-14-21
Sample ID | Filter ID N/A | Analyst RS

	Impingers 1	2	3		Imp.Total	Silica Gel grams	Total
Contents							
Final	889.0	724.8	541.4			804.2	
Initial	766.9	708.4	540.0			794.4	
Gain	122.1	16.4	1.4		139.9	9.8	149.7

Impinger Color | Labled?
Silica Gel Condition | Sealed?

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS®
Integrated Air Services

Sample and Velocity Traverse Points - Method 1

VD 10/13/21

Client: New Indy
Loaction/Plant: Catawba, SC
Operator: VD

Source: No. 2 Combination Boiler
W.O. Number: 15730.001.008
Date: 6/29/21

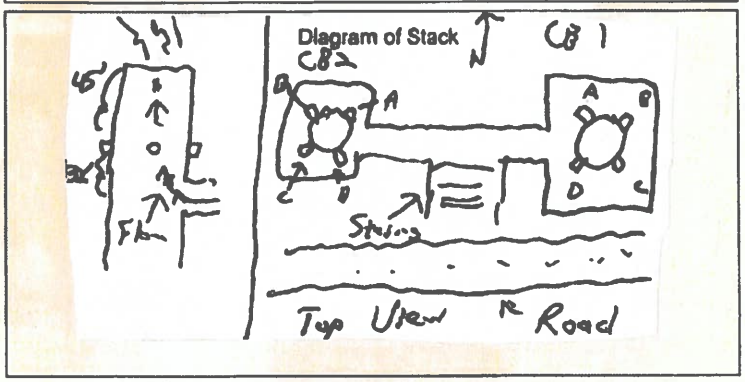
Duct Type ☑ Circular ☐ Rectangular
Traverse Type ☐ Particulate Traverse ☑ Velocity Traverse ☐ Stratification Traverse

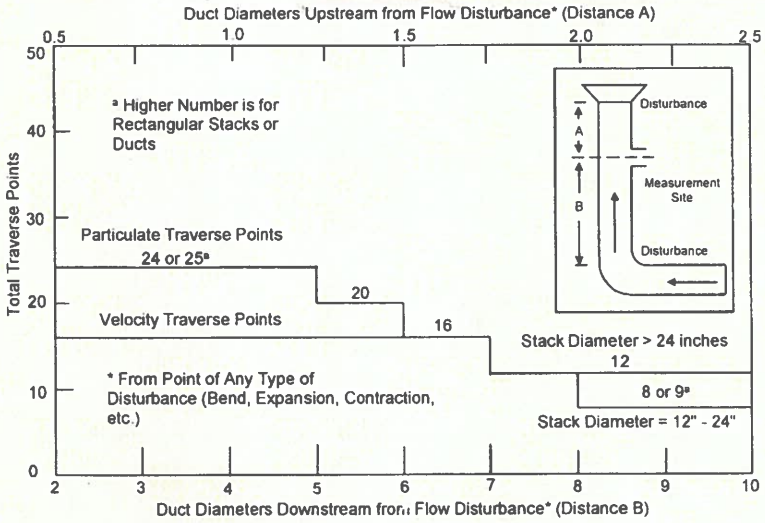
Depth, far wall to outside of port (in) = C	129
Port Depth (in) = D	9
Depth of Duct, diameter (in) = C - D	120
Area of Duct (ft^3)	78.54
Number of Ports	4
Traverse Points per Port	4
Total Traverse Points	16

Rectangular Ducts Only	
Width of Duct (in)	
Equivalent Diameter (in)	

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	3.9	12.9
2	10.5	12.6	21.6
3	19.4	23.3	32.3
4	32.3	38.8	47.8

Flow Disturbances	
Upstream - A (ft)	45
Downstream - B (ft)	32
Upstream - A (duct diameters)	4.5
Downstream - B (duct diameters)	3.2





Traverse Point Location % of Stack - Circular

Traverse Point \ Number of Traverse Points	1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25.0		14.6		10.5		8.2		6.7
3				75.0		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25.0
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75.0
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location % of Stack - Rectangular

Traverse Point \ Number of Traverse Points	1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Tape measure ID _____

RUN SUMMARY

Number 1

Client: **New Indy** | Project Number: **15730.001.009**
Location: **Catawba, SC** | Operator: **VD**
Source: **No. 2 Combination Boiler** | Calibration **1** | Date: **14 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 08:30 to 09:30

Run Averages

	10.7	8.0	275

Pre-run Bias at 08:02

Zero Bias	0.0	0.1	6
Span Bias	10.1	9.9	452
Span Gas	10.1	10.2	458

Post-run Bias at 09:31

Zero Bias	0.0	0.2	6
Span Bias	10.1	9.9	454
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

10.8	8.2	275

RUN SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 10:26 to 11:26

Run Averages

	10.0	9.3	263

Pre-run Bias at 09:31

Zero Bias	0.0	0.2	6
Span Bias	10.1	9.9	454
Span Gas	10.1	10.2	458

Post-run Bias at 11:28

Zero Bias	0.0	0.2	10
Span Bias	10.1	9.9	452
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

	10.1	9.5	262

RUN SUMMARY

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 12:22 to 13:22

Run Averages

	11.5	7.4	287

Pre-run Bias at 11:28

Zero Bias	0.0	0.2	10
Span Bias	10.1	9.9	452
Span Gas	10.1	10.2	458

Post-run Bias at 13:23

Zero Bias	0.0	0.2	10
Span Bias	10.1	9.9	453
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

	11.5	7.5 ✓	286 ✓

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
With SOG's & NCG's						
08:31	4483	11.4	2919	7.4	2765	268
08:32	4490	11.4	2912	7.3	2781	269
08:33	4500	11.5	2903	7.3	2740	265
08:34	4585	11.7	2824	7.1	2740	265
08:35	4527	11.5	2866	7.2	2753	266
08:36	4437	11.3	2952	7.4	2772	268
08:37	4532	11.5	2865	7.2	2792	270
08:38	4455	11.3	2933	7.4	2765	268
08:39	4456	11.3	2933	7.4	2732	264
08:40	4472	11.4	2920	7.4	2696	261
08:41	4486	11.4	2906	7.3	2673	258
08:42	4522	11.5	2874	7.2	2746	266
08:43	4553	11.6	2843	7.2	2757	267
08:44	4439	11.3	2947	7.4	2768	268
08:45	4456	11.3	2932	7.4	2802	271
08:46	4375	11.1	3007	7.6	2751	266
08:47	4410	11.2	2980	7.5	2735	265
08:48	4426	11.3	2960	7.5	2751	266
08:49	4358	11.1	3024	7.6	2746	266
08:50	4355	11.1	3027	7.6	2796	271
08:51	4336	11.0	3043	7.7	2793	270
08:52	4286	10.9	3091	7.8	2768	268
08:53	4308	11.0	3070	7.7	2788	270
08:54	4255	10.8	3119	7.9	2847	276
08:55	4262	10.9	3112	7.8	2855	276
08:56	4230	10.8	3146	7.9	2808	272
08:57	4309	11.0	3075	7.7	2787	270
08:58	4289	10.9	3084	7.8	2779	269
08:59	4214	10.7	3155	7.9	2852	276
09:00	4207	10.7	3166	8.0	2838	275
09:01	4234	10.8	3137	7.9	2826	274
09:02	4182	10.7	3183	8.0	2872	278
09:03	4090	10.4	3262	8.2	2899	281
09:04	3992	10.2	3341	8.4	3024	293
09:05	4000	10.2	3329	8.4	3140	305
09:06	4020	10.3	3315	8.4	3181	309
09:07	3980	10.2	3346	8.4	3172	308
09:08	3952	10.1	3381	8.5	3250	316
09:09	3988	10.2	3349	8.4	3144	305
09:10	3967	10.1	3376	8.5	3122	303

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
09:11	3891	9.9	3449	8.7	3052	296
09:12	3907	10.0	3441	8.7	3006	291
09:13	3923	10.0	3428	8.6	2990	290
09:14	3956	10.1	3400	8.6	2941	285
09:15	3966	10.1	3392	8.5	2955	286
09:16	3937	10.0	3423	8.6	2907	282
09:17	3942	10.1	3426	8.6	2882	279
09:18	3978	10.1	3394	8.6	2879	279
09:19	3997	10.2	3375	8.5	2848	276
09:20	3963	10.1	3410	8.6	2835	275
09:21	3985	10.2	3389	8.5	2767	268
09:22	4009	10.2	3369	8.5	2773	268
09:23	3983	10.2	3396	8.6	2759	267
09:24	4011	10.2	3374	8.5	2708	262
09:25	4018	10.2	3365	8.5	2708	262
09:26	4040	10.3	3341	8.4	2694	261
09:27	4065	10.4	3322	8.4	2708	262
09:28	4083	10.4	3306	8.3	2660	257
09:29	4128	10.5	3269	8.2	2640	255
09:30	4131	10.5	3261	8.2	2613	253
Avgs	**4206**	**10.7**	**3169**	**8.0**	**2836**	**275**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
With SOG's & NCG's						
10:27	4056	10.3	3599	9.1	2533	245
10:28	4087	10.4	3566	9.0	2549	246
10:29	3975	10.1	3667	9.2	2634	255
10:30	3987	10.2	3658	9.2	2658	257
10:31	4003	10.2	3642	9.2	2642	255
10:32	3970	10.1	3672	9.2	2650	256
10:33	4101	10.5	3547	8.9	2609	252
10:34	4076	10.4	3565	9.0	2655	257
10:35	4044	10.3	3590	9.0	2744	266
10:36	3948	10.1	3674	9.3	2801	271
10:37	3883	9.9	3735	9.4	2931	284
10:38	3826	9.8	3795	9.6	2944	285
10:39	3832	9.8	3788	9.5	2899	281
10:40	3860	9.8	3761	9.5	2926	284
10:41	3865	9.9	3766	9.5	2847	276
10:42	3914	10.0	3721	9.4	2812	272
10:43	3950	10.1	3688	9.3	2757	267
10:44	4021	10.3	3623	9.1	2702	261
10:45	4079	10.4	3568	9.0	2686	260
10:46	4114	10.5	3536	8.9	2704	262
10:47	4116	10.5	3532	8.9	2710	262
10:48	4115	10.5	3532	8.9	2733	264
10:49	4120	10.5	3523	8.9	2710	262
10:50	4143	10.6	3497	8.8	2739	265
10:51	4103	10.5	3537	8.9	2754	267
10:52	4096	10.4	3548	8.9	2749	266
10:53	4075	10.4	3571	9.0	2701	261
10:54	4076	10.4	3570	9.0	2723	263
10:55	4051	10.3	3595	9.1	2754	267
10:56	4084	10.4	3563	9.0	2717	263
10:57	4105	10.5	3544	8.9	2705	262
10:58	4146	10.6	3507	8.8	2702	261
10:59	4065	10.4	3551	8.9	2683	259
11:00	4061	10.4	3547	8.9	2655	257
11:01	4072	10.4	3537	8.9	2664	258
11:02	4025	10.3	3580	9.0	2686	260
11:03	4075	10.4	3536	8.9	2662	257
11:04	4078	10.4	3529	8.9	2687	260
11:05	4041	10.3	3564	9.0	2711	262
11:06	3978	10.1	3621	9.1	2747	266

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
11:07	3965	10.1	3638	9.2	2761	267
11:08	3944	10.1	3658	9.2	2771	268
11:09	3893	9.9	3708	9.3	2707	262
11:10	3903	10.0	3700	9.3	2696	261
11:11	3890	9.9	3713	9.4	2723	263
11:12	3862	9.9	3742	9.4	2699	261
11:13	3790	9.7	3808	9.6	2732	264
11:14	3677	9.4	3916	9.9	2722	263
11:15	3600	9.2	3991	10.0	2688	260
11:16	3570	9.1	4021	10.1	2672	258
11:17	3483	8.9	4107	10.3	2679	259
11:18	3514	9.0	4075	10.3	2671	258
11:19	3464	8.9	4121	10.4	2659	257
11:20	3461	8.8	4122	10.4	2684	260
11:21	3554	9.1	4031	10.1	2682	259
11:22	3696	9.4	3901	9.8	2696	261
11:23	3787	9.7	3809	9.6	2702	261
11:24	3841	9.8	3747	9.4	2712	262
11:25	3863	9.9	3717	9.4	2783	269
11:26	3742	9.6	3824	9.6	2849	276
Avgs	**3929**	**10.0**	**3692**	**9.3**	**2719**	**263**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
With SOG's & NCG's						
12:23	4738	12.1	2758	7.0	2851	276
12:24	4698	12.0	2792	7.0	2850	276
12:25	4520	11.5	2908	7.3	2863	277
12:26	4501	11.5	2917	7.4	2883	279
12:27	4572	11.6	2852	7.2	2837	275
12:28	4607	11.7	2817	7.1	2837	275
12:29	4583	11.7	2836	7.1	2846	276
12:30	4572	11.6	2847	7.2	2864	277
12:31	4492	11.4	2920	7.4	2916	283
12:32	4502	11.5	2915	7.3	2886	280
12:33	4512	11.5	2904	7.3	2813	272
12:34	4452	11.3	2954	7.4	2877	279
12:35	4375	11.1	3032	7.6	2854	276
12:36	4387	11.2	3023	7.6	2900	281
12:37	4416	11.2	2997	7.6	2871	278
12:38	4403	11.2	3007	7.6	2818	273
12:39	4409	11.2	3000	7.6	2878	279
12:40	4450	11.3	2964	7.5	2923	283
12:41	4427	11.3	2981	7.5	2878	279
12:42	4394	11.2	3017	7.6	2864	277
12:43	4512	11.5	2907	7.3	2883	279
12:44	4501	11.5	2914	7.3	2918	283
12:45	4519	11.5	2895	7.3	2968	288
12:46	4526	11.5	2893	7.3	2974	288
12:47	4496	11.4	2918	7.4	2945	285
12:48	4515	11.5	2902	7.3	2930	284
12:49	4507	11.5	2908	7.3	2955	286
12:50	4447	11.3	2961	7.5	2979	289
12:51	4434	11.3	2980	7.5	3010	292
12:52	4523	11.5	2899	7.3	2975	288
12:53	4523	11.5	2895	7.3	2978	289
12:54	4512	11.5	2905	7.3	2993	290
12:55	4515	11.5	2904	7.3	2971	288
12:56	4483	11.4	2931	7.4	2979	289
12:57	4469	11.4	2944	7.4	2957	287
12:58	4461	11.4	2951	7.4	2960	287
12:59	4434	11.3	2977	7.5	2975	288
13:00	4491	11.4	2924	7.4	2972	288
13:01	4529	11.5	2889	7.3	2969	288
13:02	4530	11.5	2889	7.3	3000	291

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
13:03	4505	11.5	2911	7.3	2970	288
13:04	4486	11.4	2927	7.4	2960	287
13:05	4399	11.2	3012	7.6	2981	289
13:06	4426	11.3	2989	7.5	2999	291
13:07	4467	11.4	2951	7.4	2980	289
13:08	4493	11.4	2927	7.4	3001	291
13:09	4503	11.5	2916	7.3	3018	293
13:10	4514	11.5	2905	7.3	3007	292
13:11	4579	11.7	2845	7.2	3009	292
13:12	4604	11.7	2820	7.1	3026	293
13:13	4619	11.8	2802	7.1	3036	294
13:14	4576	11.6	2844	7.2	3058	297
13:15	4530	11.5	2884	7.3	3101	301
13:16	4481	11.4	2929	7.4	3124	303
13:17	4459	11.4	2950	7.4	3079	299
13:18	4457	11.3	2952	7.4	3081	299
13:19	4500	11.5	2913	7.3	3114	302
13:20	4538	11.5	2880	7.3	3052	296
13:21	4496	11.4	2916	7.3	3079	299
13:22	4492	11.4	2920	7.4	3065	297
Avgs	**4501**	**11.5**	**2917**	**7.4**	**2956**	**287**

BIAS
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 08:02

O_2
Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-56	0.0	0.0	0.0	Pass
Span	10.1	3943	10.1	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	49	0.1	0.0	0.0	Pass
Span	9.9	3918	9.9	0.0	0.0	Pass

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	119	6	6	0.7	Pass
Span	458	4631	452	-6	-0.7	Pass

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 09:31

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-50	0.0	0.0	0.0	Pass
Span	10.1	3959	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-50	0.0	0.0	0.0	Pass
Span	10.1	3959	10.1	0.0	0.0	Pass

*Bias No. 1

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	63	0.2	0.1	0.5	Pass
Span	9.9	3915	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.1	63	0.2	0.1	0.5	Pass
Span	9.9	3915	9.9	0.0	0.0	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 09:31

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	117	6	6	0.7	Pass
Span	458	4648	454	-4	-0.4	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	6	117	6	0	0.0	Pass
Span	452	4648	454	2	0.2	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 11:28

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-54	0.0	0.0	0.0	Pass
Span	10.1	3942	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-54	0.0	0.0	0.0	Pass
Span	10.1	3942	10.1	0.0	0.0	Pass

*Bias No. 2

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	76	0.2	0.1	0.5	Pass
Span	9.9	3919	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	76	0.2	0.0	0.0	Pass
Span	9.9	3919	9.9	0.0	0.0	Pass

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 11:28

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	167	10	10	1.1	Pass
Span	458	4630	452	-6	-0.7	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	6	167	10	4	0.4	Pass
Span	454	4630	452	-2	-0.2	Pass

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 13:23

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-52	0.0	0.0	0.0	Pass
Span	10.1	3947	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-52	0.0	0.0	0.0	Pass
Span	10.1	3947	10.1	0.0	0.0	Pass

*Bias No. 3

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	58	0.2	0.1	0.5	Pass
Span	9.9	3913	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	58	0.2	0.0	0.0	Pass
Span	9.9	3913	9.9	0.0	0.0	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 13:23

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	164	10	10	1.1 ✓	Pass
Span	458	4640	453	-5	-0.5 ✓	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	10	164	10	0	0.0 ✓	Pass
Span	452	4640	453	1	0.1 ✓	Pass

*Bias No. 3

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 07:50

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	-55
10.1	EB0062273	3952
20.0	CC335419	7915

Curve Coefficients

Slope	Intercept	Corr. Coeff.
398.7	-67	>0.9999

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	49
10.2	EB0062273	3913
19.8	CC335419	7940

Curve Coefficients

Slope	Intercept	Corr. Coeff.
398.2	-10	0.9996

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 07:50

SO_2
Method: EPA 6C
Calibration Type: Linear Regression

Calibration Results

ppm	Cylinder ID	Result, mv
Zero	-	59
458	EB0108003	4692
911	CC259060	9262

Curve Coefficients

Slope	Intercept	Corr. Coeff.
10.11	61	>0.9999

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 07:50

O_2

Method: EPA 3A
Span Conc. 20.0 %
Slope 398.7 **Intercept** -66.8

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-55	0.0	0.0	0.0	Pass
10.1	3952	10.1	0.0	0.0	Pass
20.0	7915	20.0	0.0	0.0	Pass

CO_2

Method: EPA 3A
Span Conc. 19.8 %
Slope 398.2 **Intercept** -10.4

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	49	0.1	0.1	0.5	Pass
10.2	3913	9.9	-0.3	-1.5	Pass
19.8	7940	20.0	0.2	1.0	Pass

SO_2

Method: EPA 6C
Span Conc. 911 ppm
Slope 10.11 **Intercept** 61

Standard ppm	Response mv	Result ppm	Difference ppm	Error %	Status
Zero	59	0	0	0.0	Pass
458	4692	458	0	0.0	Pass
911	9262	911	0	0.0	Pass

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

File: C:\Data\211014 New Indy Catawba No. 2 Combination Boiler.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSTRLXX-PC **Trailer:** 88
Analog Input Device: MCC USB-1608G

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**20.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.8**

Channel 5

Analyte	**SO_2**
Method	**EPA 6C**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T100H SN410**
Full-Scale Output, mv	**10000**
Analyzer Range, ppm	**1000**
Span Concentration, ppm	**911**

NO. 2 COMBINATION BOILER
(CONDITION 2: NCG GASES ONLY)

New Indy
Catawba, SC

15730.001.009
No. 2 Combination Boiler
Condition 2: NCGs Only

EMISSION CALCULATIONS

		Run 1	Run 2	Run 3	Mean
Date		**10/14/21**	**10/14/21**	**10/14/21**	---
Time Began		**1410**	**1547**	**1725**	---
Time Ended		**1510**	**1647**	**1825**	---
Volumetric Flow Rate, (Qs), DSCFM		1.33E+05	1.33E+05	1.33E+05	1.33E+05
BWS		0.154	0.151	0.149	0.152
% Oxygen		11.9	11.2	11.7	11.6
Sulfur Dioxide	MW= 64.06				
Concentration, ppm		235.0	234.0	232.0	233.7
Emission Rate, lb/hr		311.3	311.0	307.4	309.9

NIC PM and speciated TRS V2

New Indy
Catawba, SC

15730.001.009
No. 2 Combination Boiler

Condition 2: NCGs Only

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		10/14/21	10/14/21	10/14/21	---
Time Began		1410	1547	1725	---
Time Ended		1529	1707	1844	---
INPUT DATA					
Sampling Time, min	(Theta)	64.0	64	64	64
Stack Diameter, in.	(Dia.)	120.00	120.00	120.00	120.00
Barometric Pressure, in. Hg	(Pb)	29.65	29.65	29.65	29.65
Static Pressure, in. H2O	(Pg)	-1.10	-1.10	-1.10	-1.10
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	1.0000	1.0000	1.0000	1.0000
Orifice Calibration Value	(Delta H@)	2.0490	2.0490	2.0490	2.0490
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	39.460	39.485	39.390	39.445
Meter Temperature, °F	(Tm)	96.3	96.3	90.9	94.5
Meter Temperature, °R	(Tm-R)	556.3	556.3	550.9	554.5
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	143.8	141.1	139.9	141.6
CO2 Concentration, %	(CO2)	7.2	7.6	7.0	7.3
O2 Concentration, %	(O2)	11.9	11.2	11.7	11.6
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.773	0.775	0.770	0.773
Stack Temperature, °F	(Ts)	456.8	461.2	459.7	459.2
Stack Temperature, °R	(Ts-R)	916.8	921.2	919.7	919.2
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	78.54	78.54	78.54	78.54
Stack Pressure, in. Hg	(Ps)	29.57	29.57	29.57	29.57
Meter Pressure, in. Hg	(Pm)	29.75	29.75	29.75	29.75
Standard Meter Volume, ft^3	(Vmstd)	37.219	37.246	37.519	37.328
Standard Water Volume, ft^3	(Vwstd)	6.769	6.642	6.585	6.665
Moisture Fraction (Measured)	(BWS)	0.154	0.151	0.149	0.152
Moisture Fraction (lower sat/meas)	(BWS)	0.154	0.151	0.149	0.152
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	29.63	29.66	29.59	29.63
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	27.84	27.90	27.86	27.87
Average Stack Gas Velocity, ft/sec	(Vs)	58.55	58.84	58.44	58.61
Stack Gas Flow, actual, ft^3/min	(Qa)	275913	277283	275402	276199
Stack Gas Flow, Std , ft^3/min	(Qs)	132829	133245	132873	132982
Calibration check	(Yqa)	0.9871	0.9858	0.9846	0.986
Percent difference from Y					-1.42%

NIC PM and speciated TRS V2

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	84	°F	
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.65	in. Hg	
Source	No. 2 Combination Boiler	Console ΔH@	2.054.9 AB 10/22	Static Pressure	-1.1	in. H_2O	
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	134.9	mL	
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	8.9	g	
Run Number	1	Pitot ID/Coeff.	P284 / 0.84				
Date	10-14-21	Thermo ID	AO25	Stack Area	78.54	ft^2	
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25 / 0.250 / 0.250 / 0.250				
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16		

K Factor	N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.001	0.000
@ Vac., in. Hg	15"	5"
Pitot	good	good

Filter ID N/A

Sample ID N/A

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS*
	0	14:10			90,950									
A-1	4		.75	1.3	93.4	461	x	94	252	256	x	64	1	
2	8		.74	1.3	95.9	461	x	95	253	255	x	60	1	
3	12		.69	1.3	98.4	460	x	95	254	254	x	59	1	
4	16		.64	1.3	100.8	460	x	96	254	255	x	60	1	
B-1	20		.72	1.3	103.3	457	x	95	253	256	x	64	1	
2	24		.74	1.3	105.7	456	x	95	254	255	x	64	1	
3	28		.74	1.3	108.2	455	x	96	255	255	x	61	1	
4	32		.70	1.3	110.6	455	x	96	254	255	x	61	1	
C-1	36		.63	1.3	113.1	456	x	96	254	254	x	64	1	
2	40		.47	1.3	115.6	456	x	96	254	254	x	64	1	
3	44		.45	1.3	118.1	454	x	97	254	255	x	65	1	
4	48		.40	1.3	120.5	454	x	97	255	255	x	65	1	
D-1	52		.64	1.3	123.0	455	x	98	254	254	x	65	1	
2	56		.52	1.3	125.5	456	x	98	255	256	x	66	1	
3	60		.44	1.3	128.0	456	x	98	255	255	x	64	1	
4	64	15:29	.40	1.3	130.410	456	x	99	254	255	x	62	1	
			Avg √Δp	Avg ΔH	Total Volume	Avg T_s		Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac	$V_{m\text{-}std}$
			.7726	1.3	39.460	456.75 AB 10/22		96.31	254/255	254/256		65	1	scf

*Barometric Pressure is at port elevation

Avg Δ P = .60484 AB 10/22

Avg √ΔH 1.1402

Comments AB 10/22

Condition 2

Flue Gas Composition

Oxygen, %

Carbon Dioxide, %

Moisture, %

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run

Post-run

Thermocouple Check

Meter Temp., °F

Ref. Temp., °F

Result

Q_s, dscfm

% Isokinetic

Calculated by

QC by AM

WESTON SOLUTIONS
Integrated Air Services

15730.001.009
#1-2 CBs SO2
Emission Report

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	85°	°F	
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.65	in. Hg	
Source	No. 2 Combination Boiler	Console ΔH@	2.05	Static Pressure	-1.1	in. H_2O	
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	130.3	mL	
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	10.8	g	
Run Number	2	Pitot ID/Coeff.	P284 / 0.84				
Date	10-14-21	Thermo ID	AO25	Stack Area	78.54	ft^2	
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25 / 0.250 / 0.250 / 0.250				
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16		

K Factor	N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.001	0.001
@ Vac., in. Hg	5"	5"
Pitot	good	good

Filter ID N/A

Sample ID N/A

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	15:47			130.470									
C-1	4		.60	1.3	133.0	459	x	98	254	255	x	66	2	
2	8		.52	1.3	135.4	458	x	98	255	255	x	61	2	
3	12		.44	1.3	137.8	457	x	96	254	254	x	61	2	
4	16		.40	1.3	140.3	457	x	96	254	255	x	60	2	
B-1	20		.75	1.3	142.7	459	x	96	255	255	x	63	2	
2	24		.78	1.3	145.3	459	x	96	254	254	x	63	2	
3	28		.74	1.3	147.7	460	x	96	254	255	x	63	2	
4	32		.71	1.3	150.2	460	x	96	254	255	x	63	2	
A-1	36		.75	1.3	152.7	461	x	96	255	254	x	64	2	
2	40		.72	1.3	155.2	463	x	96	255	254	x	65	2	
3	44		.68	1.3	157.7	463	x	96	255	254	x	65	2	
4	48		.63	1.3	160.1	465	x	96	255	254	x	65	2	
D-1	52		.65	1.3	162.7	465	x	96	254	254	x	66	2	
2	56		.53	1.3	165.1	465	x	96	254	255	x	65	2	
3	60		.44	1.3	167.5	464	x	96	255	256	x	64	2	
4	64	17:07	.40	1.3	169.955	464	x	96	254	254	x	63	2	
			Avg √Δp .7754	Avg ΔH 1.3	Total Volume 39.485	Avg T_s 461.19		Avg T_m 96.25	Min/Max 254/255	Min/Max 254/256	Min/Max	Max Temp 66	Max Vac 2	

*Barometric Pressure is at port elevation

Avg ΔP = .608 78

Avg √ΔH 1.1402

Comments AB 10/26 AB 10/26

condition 2

Flue Gas Composition

Oxygen, %

Carbon Dioxide, %

Moisture, %

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run

Post-run

Thermocouple Check

Meter Temp., °F

Ref. Temp., °F

Result

$V_{m\text{-}std}$, scf

Q_s, dscfm

% Isokinetic

Calculated by

QC by

WESTON SOLUTIONS® Integrated Air Services

15730.001.009 #1-2 CBs SO2 Emission Report

Isokinetic Field Data

Method: EPA 4, Moisture

Client	New Indy	Console ID	AO25	Ambient Temp.	84 °F	K Factor	N/A
Location/Plant	Catawba, SC	Meter Corr., Y	1.000	Baro. Pressure*	29.65 in. Hg		
Source	No. 2 Combination Boiler	Console ΔH@	2.05	Static Pressure	-1.1 in. H_2O		
Sample Location	Stack	Probe ID/Length	PR-5Z	Impinger Gain	130.4 mL		
W. O. Number	15730.001.009	Liner Material	SS	Silica Gel Gain	95 g		
Run Number	3	Pitot ID/Coeff.	P284 / 0.84				
Date	10-14-21	Thermo ID	AO25	Stack Area	78.54 ft^2		
Test Personnel	RS / BE	Nozzle ID/Diams.	0.25 / 0.250 / 0.250 / 0.250				
Sample Time	64 min.	Avg. Nozzle Diam.	0.250 in.	Total Traverse Points	16		

Leak Checks

	Initial	Final
Volume, ft^3	0.001	0.000
@ Vac., in. Hg	15"	4"
Pitot	good	good

Filter ID N/A

Sample ID N/A

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (In Hg)	COMMENTS
	0	17:25			170.060									
A-1	4		.73	1.3	172.5	462	x	92	252	257	x	64	2	
2	8		.70	1.3	175.0	462	x	91	254	256	x	63	2	
3	12		.67	1.3	177.5	462	x	91	254	255	x	62	2	
4	16		.61	1.3	179.9	462	x	91	254	255	x	61	2	
B-1	20		.73	1.3	182.4	458	x	92	255	254	x	64	2	
2	24		.75	1.3	184.9	459	x	92	255	254	x	64	2	
3	28		.74	1.3	187.3	459	x	92	255	255	x	64	2	
4	32		.71	1.3	189.8	459	x	92	255	256	x	64	2	
C-1	36		.56	1.3	192.	454	x	91	255	254	x	66	2	
2	40		.52	1.3	194.8	452	x	91	254	254	x	65	2	
3	44		.45	1.3	197.2	459	x	91	254	254	x	64	2	
4	48		.40	1.3	199.6	461	x	91	254	254	x	63	2	
D-1	52		.65	1.3	202.2	462	x	90	255	254	x	64	2	
2	56		.54	1.3	204.5	464	x	89	255	254	x	64	2	
3	60		.44	1.3	207.0	460	x	89	255	254	x	65	2	
4	64	18:44	.40	1.3	209.450	460	x	89	254	254	x	66	2	
			Avg √Δp	Avg ΔH	Total Volume	Avg T_s		Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac	$V_{m\text{-}std}$, scf
			.7702	1.3	39.340	459.69		90.875	252/255	254/257		66	2	

*Barometric Pressure is at port elevation

Avg Δ P = .6060 Avg √ΔH 1.1402

Comments AM 10/12/21

Flue Gas Composition

Oxygen, %

Carbon Dioxide, %

Moisture, %

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run

Post-run

Thermocouple Check

Meter Temp., °F

Ref. Temp., °F

Result

Q_s, dscfm

% Isokinetic

Calculated by

QC by AM

Condition 2

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC

Source: No. 2 Combination Boiler
W.O. Number: 15730.001.009

Impingers 1 - 3 measurements in **grams**

Run No. 1 | Sample Date 10-14-21 | Recovery Date 10-14-21
Sample ID | Filter ID N/A | Analyst RS

	Impingers 1	2	3		Imp.Total	Silica Gel grams	Total
Contents							
Final	896.1	704.2	543.6			813.1	
Initial	779.8 ✓	687.8 ✓	541.4 ✓		✓	804.2 ✓	
Gain	116.3 ✓	16.4 ✓	2.2 ✓		134.9	8.9 ✓	143.8 ✓

Impinger Color | Labled?
Silica Gel Condition | Sealed?

Run No. 2 | Sample Date 10-14-21 | Recovery Date 10-14-21
Sample ID | Filter ID N/A | Analyst RS

	Impingers 1	2	3		Imp.Total	Silica Gel grams	Total
Contents							
Final	887.8	721.7	547.2			830.5	
Initial	778.6	704.2	543.6		✓	819.7	
Gain	109.2 ✓	17.5 ✓	3.6 ✓		130.3	10.8 ✓	141.1 ✓

Impinger Color | Labled?
Silica Gel Condition | Sealed?

Run No. 3 | Sample Date 10-14-21 | Recovery Date 10-14-21
Sample ID | Filter ID N/A | Analyst RS

	Impingers 1	2	3		Imp.Total	Silica Gel grams	Total
Contents							
Final	871.4	720.4	549.9			840.0	
Initial	760.0 ✓	704.1 ✓	547.2 ✓		✓	830.5 ✓	
Gain	111.4 ✓	16.3 ✓	2.7 ✓		130.4	9.5 ✓	139.9 ✓

Impinger Color | Labled?
Silica Gel Condition | Sealed?

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS®
Integrated Air Services

RUN SUMMARY

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 14:10 to 15:10

Run Averages

	11.8	7.0	239

Pre-run Bias at 13:23

Zero Bias	0.0	0.2	10
Span Bias	10.1	9.9	453
Span Gas	10.1	10.2	458

Post-run Bias at 15:11

Zero Bias	0.0	0.2	11
Span Bias	10.1	9.9	459
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

11.9	7.2	235

RUN SUMMARY

Number 5

Client: **New Indy** | Project Number: **15730.001.009**
Location: **Catawba, SC** | Operator: **VD**
Source: **No. 2 Combination Boiler** | Calibration **1** | Date: **14 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 15:47 to 16:47

Run Averages

	11.2	7.4	240

Pre-run Bias at 15:11

Zero Bias	0.0	0.2	11
Span Bias	10.1	9.9	459
Span Gas	10.1	10.2	458

Post-run Bias at 16:48

Zero Bias	0.0	0.2	10
Span Bias	10.1	9.9	460
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

	11.2	7.6	234

RUN SUMMARY

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 17:25 to 18:25

Run Averages

	11.7	6.8	235

Pre-run Bias at 16:48

Zero Bias	0.0	0.2	10
Span Bias	10.1	9.9	460
Span Gas	10.1	10.2	458

Post-run Bias at 18:26

Zero Bias	0.0	0.2	8
Span Bias	10.1	9.9	448
Span Gas	10.1	10.2	458

Run averages corrected for the average of the pre-run and post-run bias

	11.7	7.0	232

RUN DATA

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
			NCG's Only			
14:11	4623	11.8	2823	7.1	2463	238
14:12	4586	11.7	2862	7.2	2490	240
14:13	4611	11.7	2837	7.2	2475	239
14:14	4574	11.6	2870	7.2	2496	241
14:15	4606	11.7	2845	7.2	2484	240
14:16	4641	11.8	2809	7.1	2419	233
14:17	4657	11.8	2792	7.0	2396	231
14:18	4688	11.9	2763	7.0	2413	233
14:19	4691	11.9	2757	7.0	2425	234
14:20	4679	11.9	2766	7.0	2450	236
14:21	4664	11.9	2782	7.0	2442	236
14:22	4676	11.9	2769	7.0	2462	238
14:23	4680	11.9	2769	7.0	2428	234
14:24	4648	11.8	2799	7.1	2426	234
14:25	4597	11.7	2847	7.2	2452	237
14:26	4592	11.7	2853	7.2	2470	238
14:27	4565	11.6	2881	7.3	2479	239
14:28	4579	11.7	2870	7.2	2441	236
14:29	4624	11.8	2827	7.1	2466	238
14:30	4692	11.9	2764	7.0	2485	240
14:31	4765	12.1	2692	6.8	2459	237
14:32	4722	12.0	2728	6.9	2488	240
14:33	4723	12.0	2729	6.9	2509	242
14:34	4761	12.1	2691	6.8	2465	238
14:35	4720	12.0	2726	6.9	2463	238
14:36	4693	11.9	2755	6.9	2535	245
14:37	4688	11.9	2759	7.0	2552	247
14:38	4652	11.8	2795	7.0	2547	246
14:39	4696	11.9	2755	6.9	2545	246
14:40	4767	12.1	2685	6.8	2549	246
14:41	4705	12.0	2743	6.9	2544	246
14:42	4671	11.9	2777	7.0	2564	248
14:43	4672	11.9	2777	7.0	2522	244
14:44	4640	11.8	2807	7.1	2492	241
14:45	4626	11.8	2818	7.1	2492	241
14:46	4646	11.8	2796	7.0	2550	246
14:47	4621	11.8	2822	7.1	2544	246
14:48	4610	11.7	2833	7.1	2549	246
14:49	4663	11.9	2786	7.0	2505	242
14:50	4655	11.8	2792	7.0	2458	237

RUN DATA

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
14:51	4670	11.9	2778	7.0	2434	235
14:52	4679	11.9	2768	7.0	2489	240
14:53	4671	11.9	2777	7.0	2533	245
14:54	4669	11.9	2780	7.0	2523	244
14:55	4689	11.9	2763	7.0	2482	240
14:56	4655	11.8	2792	7.0	2476	239
14:57	4618	11.8	2833	7.1	2489	240
14:58	4634	11.8	2819	7.1	2424	234
14:59	4635	11.8	2816	7.1	2403	232
15:00	4647	11.8	2802	7.1	2470	238
15:01	4661	11.9	2790	7.0	2473	239
15:02	4688	11.9	2766	7.0	2463	238
15:03	4697	11.9	2759	7.0	2434	235
15:04	4643	11.8	2808	7.1	2427	234
15:05	4661	11.9	2794	7.0	2383	230
15:06	4692	11.9	2762	7.0	2369	228
15:07	4585	11.7	2826	7.1	2392	231
15:08	4455	11.3	2873	7.2	2394	231
15:09	4431	11.3	2894	7.3	2408	232
15:10	4425	11.3	2900	7.3	2475	239
Avgs	**4648**	**11.8**	**2794**	**7.0**	**2472**	**239**

RUN DATA

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
15:48	4333	11.0	2989	7.5	2497	241
15:49	4359	11.1	2963	7.5	2409	232
15:50	4364	11.1	2961	7.5	2433	235
15:51	4374	11.1	2954	7.4	2449	236
15:52	4365	11.1	2959	7.5	2457	237
15:53	4342	11.1	2980	7.5	2490	240
15:54	4391	11.2	2940	7.4	2486	240
15:55	4397	11.2	2931	7.4	2475	239
15:56	4398	11.2	2925	7.4	2486	240
15:57	4327	11.0	2993	7.5	2495	241
15:58	4283	10.9	3037	7.7	2486	240
15:59	4316	11.0	3011	7.6	2490	240
16:00	4374	11.1	2956	7.5	2464	238
16:01	4341	11.1	2985	7.5	2470	238
16:02	4317	11.0	3009	7.6	2493	241
16:03	4291	10.9	3032	7.6	2463	238
16:04	4325	11.0	3000	7.6	2461	238
16:05	4280	10.9	3041	7.7	2490	240
16:06	4224	10.8	3098	7.8	2482	240
16:07	4200	10.7	3126	7.9	2462	238
16:08	4275	10.9	3054	7.7	2436	235
16:09	4336	11.0	2993	7.5	2438	235
16:10	4319	11.0	3007	7.6	2457	237
16:11	4326	11.0	3000	7.6	2475	239
16:12	4320	11.0	3004	7.6	2447	236
16:13	4263	10.9	3059	7.7	2476	239
16:14	4228	10.8	3097	7.8	2476	239
16:15	4313	11.0	3014	7.6	2453	237
16:16	4333	11.0	2993	7.5	2437	235
16:17	4380	11.2	2948	7.4	2466	238
16:18	4399	11.2	2927	7.4	2451	237
16:19	4375	11.1	2951	7.4	2509	242
16:20	4356	11.1	2967	7.5	2502	242
16:21	4361	11.1	2962	7.5	2510	242
16:22	4337	11.0	2987	7.5	2512	243
16:23	4348	11.1	2979	7.5	2483	240
16:24	4375	11.1	2951	7.4	2421	234
16:25	4390	11.2	2937	7.4	2368	228
16:26	4434	11.3	2896	7.3	2391	231
16:27	4408	11.2	2917	7.4	2412	233
16:28	4393	11.2	2934	7.4	2457	237

RUN DATA

Number 5

Client: **New Indy** Project Number: **15730.001.009**
Location: **Catawba, SC** Operator: **VD**
Source: **No. 2 Combination Boiler** Calibration **1** Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
16:29	4361	11.1	2964	7.5	2506	242
16:30	4380	11.2	2949	7.4	2506	242
16:31	4450	11.3	2882	7.3	2527	244
16:32	4482	11.4	2849	7.2	2503	242
16:33	4491	11.4	2841	7.2	2482	240
16:34	4449	11.3	2881	7.3	2542	246
16:35	4455	11.3	2877	7.3	2516	243
16:36	4455	11.3	2875	7.2	2568	248
16:37	4520	11.5	2814	7.1	2556	247
16:38	4509	11.5	2830	7.1	2557	247
16:39	4549	11.6	2788	7.0	2567	248
16:40	4520	11.5	2817	7.1	2554	247
16:41	4556	11.6	2783	7.0	2533	245
16:42	4499	11.5	2832	7.1	2539	245
16:43	4481	11.4	2855	7.2	2548	246
16:44	4541	11.6	2798	7.1	2521	243
16:45	4520	11.5	2816	7.1	2551	246
16:46	4539	11.6	2799	7.1	2554	247
16:47	4556	11.6	2784	7.0	2531	244
Avgs	**4386**	**11.2**	**2942**	**7.4**	**2486**	**240**

RUN DATA

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
17:26	4726	12.0	2676	6.7	2289	220
17:27	4492	11.4	2877	7.3	2311	223
17:28	4361	11.1	2983	7.5	2302	222
17:29	4301	11.0	3037	7.7	2354	227
17:30	4313	11.0	3025	7.6	2401	232
17:31	4310	11.0	3018	7.6	2360	228
17:32	4301	11.0	3028	7.6	2399	231
17:33	4316	11.0	3018	7.6	2399	231
17:34	4345	11.1	2990	7.5	2399	231
17:35	4364	11.1	2973	7.5	2405	232
17:36	4250	10.8	3082	7.8	2375	229
17:37	4259	10.9	3085	7.8	2362	228
17:38	4275	10.9	3073	7.7	2355	227
17:39	4423	11.3	2931	7.4	2350	227
17:40	4470	11.4	2834	7.1	2318	223
17:41	4495	11.4	2788	7.0	2324	224
17:42	4574	11.6	2697	6.8	2326	224
17:43	4662	11.9	2612	6.6	2295	221
17:44	4695	11.9	2582	6.5	2342	226
17:45	4643	11.8	2631	6.6	2354	227
17:46	4608	11.7	2661	6.7	2326	224
17:47	4664	11.9	2612	6.6	2348	226
17:48	4656	11.8	2618	6.6	2365	228
17:49	4721	12.0	2556	6.4	2392	231
17:50	4714	12.0	2560	6.5	2400	231
17:51	4822	12.3	2459	6.2	2405	232
17:52	4949	12.6	2330	5.9	2406	232
17:53	5008	12.7	2269	5.7	2404	232
17:54	5030	12.8	2249	5.7	2384	230
17:55	4987	12.7	2293	5.8	2389	230
17:56	4997	12.7	2286	5.8	2396	231
17:57	4979	12.7	2302	5.8	2409	232
17:58	4901	12.5	2377	6.0	2397	231
17:59	5165	13.1	2134	5.4	2422	234
18:00	5312	13.5	1980	5.0	2398	231
18:01	5386	13.7	1908	4.8	2432	235
18:02	5469	13.9	1832	4.6	2474	239
18:03	5505	14.0	1786	4.5	2467	238
18:04	5223	13.3	2050	5.2	2476	239
18:05	4966	12.6	2313	5.8	2509	242
18:06	4786	12.2	2509	6.3	2523	244

RUN DATA

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
18:07	4647	11.8	2651	6.7	2527	244
18:08	4582	11.7	2711	6.8	2520	243
18:09	4439	11.3	2847	7.2	2526	244
18:10	4352	11.1	2936	7.4	2542	246
18:11	4330	11.0	2982	7.5	2526	244
18:12	4364	11.1	2966	7.5	2499	241
18:13	4300	11.0	3029	7.6	2548	246
18:14	4264	10.9	3061	7.7	2584	250
18:15	4194	10.7	3131	7.9	2584	250
18:16	4225	10.8	3102	7.8	2583	250
18:17	4210	10.7	3119	7.9	2549	246
18:18	4263	10.9	3067	7.7	2514	243
18:19	4284	10.9	3047	7.7	2516	243
18:20	4299	11.0	3033	7.6	2499	241
18:21	4260	10.9	3071	7.7	2498	241
18:22	4294	10.9	3037	7.7	2546	246
18:23	4291	10.9	3045	7.7	2550	246
18:24	4331	11.0	3005	7.6	2535	245
18:25	4286	10.9	3046	7.7	2590	250
Avgs	**4594**	**11.7**	**2715**	**6.8**	**2433**	**235**

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 13:23

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-52	0.0	0.0	0.0	Pass
Span	10.1	3947	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-52	0.0	0.0	0.0	Pass
Span	10.1	3947	10.1	0.0	0.0	Pass

*Bias No. 3

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	58	0.2	0.1	0.5	Pass
Span	9.9	3913	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	58	0.2	0.0	0.0	Pass
Span	9.9	3913	9.9	0.0	0.0	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 13:23

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	164	10	10	1.1	Pass
Span	458	4640	453	-5	-0.5	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	10	164	10	0	0.0	Pass
Span	452	4640	453	1	0.1	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 15:11

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-48	0.0	0.0	0.0	Pass
Span	10.1	3951	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-48	0.0	0.0	0.0	Pass
Span	10.1	3951	10.1	0.0	0.0	Pass

*Bias No. 4

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	76	0.2	0.1	0.5	Pass
Span	9.9	3913	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	76	0.2	0.0	0.0	Pass
Span	9.9	3913	9.9	0.0	0.0	Pass

*Bias No. 4

BIAS AND CALIBRATION DRIFT

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 15:11

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	177	11	11	1.2	Pass
Span	458	4700	459	1	0.1	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	10	177	11	1	0.1	Pass
Span	453	4700	459	6	0.7	Pass

*Bias No. 4

BIAS AND CALIBRATION DRIFT

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 16:48

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-49	0.0	0.0	0.0	Pass
Span	10.1	3957	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-49	0.0	0.0	0.0	Pass
Span	10.1	3957	10.1	0.0	0.0	Pass

*Bias No. 5

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	64	0.2	0.1	0.5	Pass
Span	9.9	3912	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	64	0.2	0.0	0.0	Pass
Span	9.9	3912	9.9	0.0	0.0	Pass

*Bias No. 5

BIAS AND CALIBRATION DRIFT

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 16:48

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	165	10	10	1.1	Pass
Span	458	4709	460	2	0.2	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	11	165	10	-1	-0.1	Pass
Span	459	4709	460	1	0.1	Pass

*Bias No. 5

BIAS AND CALIBRATION DRIFT

Number 7

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 18:26

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-61	0.0	0.0	0.0	Pass
Span	10.1	3941	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-61	0.0	0.0	0.0	Pass
Span	10.1	3941	10.1	0.0	0.0	Pass

*Bias No. 6

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	78	0.2	0.1	0.5	Pass
Span	9.9	3918	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	78	0.2	0.0	0.0	Pass
Span	9.9	3918	9.9	0.0	0.0	Pass

*Bias No. 6

BIAS AND CALIBRATION DRIFT

Number 7

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 18:26

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	137	8	8	0.9	Pass
Span	458	4588	448	-10	-1.1	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	10	137	8	-2	-0.2	Pass
Span	460	4588	448	-12	-1.3	Pass

*Bias No. 6

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 07:50

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	-55
10.1	EB0062273	3952
20.0	CC335419	7915

Curve Coefficients

Slope	Intercept	Corr. Coeff.
398.7	-67	>0.9999

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	49
10.2	EB0062273	3913
19.8	CC335419	7940

Curve Coefficients

Slope	Intercept	Corr. Coeff.
398.2	-10	0.9996

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 07:50

SO_2
Method: EPA 6C
Calibration Type: Linear Regression

Calibration Results

ppm	Cylinder ID	Result, mv
Zero	-	59
458	EB0108003	4692
911	CC259060	9262

Curve Coefficients

Slope	Intercept	Corr. Coeff.
10.11	61	>0.9999

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

Start Time: 07:50

O_2

Method: EPA 3A
Span Conc. 20.0 %
Slope 398.7 **Intercept** -66.8

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-55	0.0	0.0	0.0	Pass
10.1	3952	10.1	0.0	0.0	Pass
20.0	7915	20.0	0.0	0.0	Pass

CO_2

Method: EPA 3A
Span Conc. 19.8 %
Slope 398.2 **Intercept** -10.4

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	49	0.1	0.1	0.5	Pass
10.2	3913	9.9	-0.3	-1.5	Pass
19.8	7940	20.0	0.2	1.0	Pass

SO_2

Method: EPA 6C
Span Conc. 911 ppm
Slope 10.11 **Intercept** 61

Standard ppm	Response mv	Result ppm	Difference ppm	Error %	Status
Zero	59	0	0	0.0	Pass
458	4692	458	0	0.0	Pass
911	9262	911	0	0.0	Pass

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **14 Oct 2021**

File: C:\Data\211014 New Indy Catawba No. 2 Combination Boiler.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSTRLXX-PC **Trailer:** 88
Analog Input Device: MCC USB-1608G

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**20.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.8**

Channel 5

Analyte	**SO_2**
Method	**EPA 6C**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T100H SN410**
Full-Scale Output, mv	**10000**
Analyzer Range, ppm	**1000**
Span Concentration, ppm	**911**

APPENDIX D
QUALITY CONTROL DATA

EQUIPMENT CALIBRATIONS

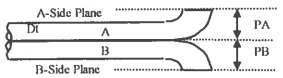
S - Type Pitot Tube Inspection Data Form

Pitot Tube ID NO. P284 Length 5' Probe ID.No. AUB-PR-5Z

If all Criteria PASS Cp is equal to 0.84

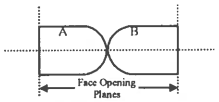
Inspection Date 1/6/2021 Individual Conducting Inspection DDS

PASS/FAIL

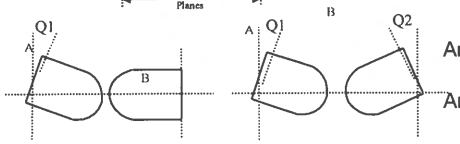


Distance to A Plane (PA) - inches 0.471 PASS
Distance to B Plane (PB) - inches 0.471 PASS
Pitot OD (D_t) - inches 0.375

$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

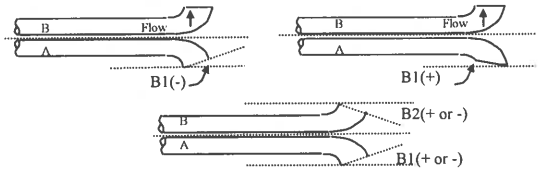


Are Open Faces Aligned Perpendicular to the Tube Axis ◉ YES ○ NO PASS



Angle of Q1 from vertical A Tube- degrees (absolute) 1 PASS
Angle of Q2 from vertical B Tube- degrees (absolute) 2 PASS

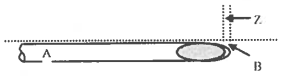
Q1 and Q2 must be ≤ 10°



Angle of B1 from vertical A Tube- degrees (absolute) 1 PASS
Angle of B1 from vertical B Tube- degrees (absolute) 0 PASS

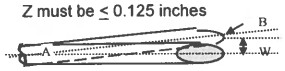
B1 or B2 must be ≤ 5°

Y = 1 O = 1



A = 0.942

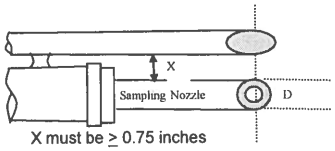
Z must be ≤ 0.125 inches



Z = A sin Y = 0.0164 PASS

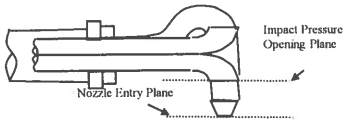
W must be ≤ 0.03125 inches

W = A sin O = 0.0164 PASS

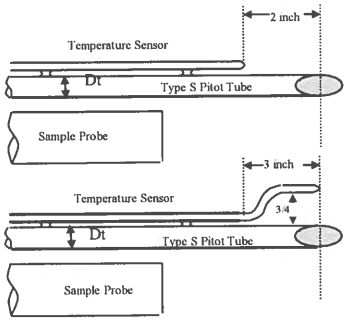


X must be ≥ 0.75 inches

Distance between Sample Nozzle and Pitot (X) - inches N/A PASS



Impact Pressure Opening Plane is above the Nozzle Entry Plane ◉ YES ○ NO ○ NA PASS



Thermocouple meets the Distance Criteria in the adjacent figure ◉ YES ○ NO ○ NA PASS

Thermocouple meets the Distance Criteria in the adjacent figure ○ YES ○ NO ◉ NA

POSTTEST CHECK

Client NewIndy Catawba Work Order Number 15730.001.009

Date 10-26-21 Damage Found? ____ YES ✓ NO

Checked By JM

Integrated Air Services

Stack Temperature Sensor Calibration Data

Choose Reference Thermometer Below:

☐ Digital Thermometer - Omega Model CL3515R (Serial# 06000183)

☑ Digital Thermometer - Omega Model CL3515R (Serial# 12000230)

Thermocouple Number: AUB-PR-5Z Length: 5'
Date: 6-Jan-21
Ambient Temperature,°F: 57
Calibrator: DDS

Reference Point Number	Reference Temperature ° F	Thermocouple Temperature ° F	Temperature Difference %
1 - A	58	58	0.00
B	58	58	0.00
C	58	58	0.00
2 - A	38	39	0.20
B	38	39	0.20
C	38	39	0.20
3 - A	211	211	0.00
B	211	211	0.00
C	211	211	0.00

$$\text{Temp Diff (\%)} = \frac{|(\text{Ref Temp, °F} + 460) - (\text{Therm Temp °F} + 460)|}{\text{Ref Temp,° F} + 460} \times 100$$

Are all temperature differences less than +/- 1.5% ? YES

POSTTEST STACK TEMPERATURE SENSOR CALIBRATION DATA

Client: NI Catawba
Work Order Number: 15730.001.005
Date: 10-26-21
Calibrator: JVA

Ambient Temp,° F	Reference Temp,° F	Thermocouple Temp,° F	Temperature Diff, %
74	74	74	0

Was a pretest temperature correction used ? ____yes ✓no
Is temperature difference within +/- 1.5% ✓yes ____no
If no, calculations done once with recorded values and once with corrected values ____

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

Integrated Air Services

1) Select three critical orifices to calibrate the dry gas meter which bracket the expected operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record readings in colored boxes below, other columns are automatically calculated.

DATE: 14-May-2021
METER PART #: AO25
METER SERIAL #: 9717.61
CRITICAL ORIFICE SET SERIAL #: 1331s & 1825
BAROMETRIC PRESSURE (in Hg): INITIAL 29.59, FINAL 29.59, AVG (P_{bar}) 29.59
Calibrated by: LoF
Barometer ID: 200567181

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	DGM READINGS (FT^3) NET (V_m)	AMBIENT F°	DGM F° INITIAL	DGM F° FINAL	Avg DGM F° T_m	ELAPSED TIME (MIN) θ	DGM ΔH (in H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	(4) $\Delta H_@$
8	1	0.2300	23	929.100	937.472	8.372	69	70	71	71	28	0.30	8.248	8.288	1.005	1.900
12	2	0.3326	21	937.711	946.387	8.676	70	71	71	71	20	0.64	8.547	8.552	1.001	1.943
16	3	0.4379	21	972.140	989.873	17.733	71	73	74	74	31	1.20	17.412	17.437	1.001	2.102
19	4	0.5162	19	913.500	928.906	15.406	68	68	69	69	23	1.60	15.285	15.293	1.001	2.028
25	5	0.6846	17	962.902	971.830	8.928	71	72	73	73	10	2.95	8.821	8.793	0.997	2.137
31	6	0.8304	15	947.100	962.183	15.083	71	72	72	72	14	4.40	14.969	14.933	0.998	2.183
														AVG =	1.000	2.049

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:
The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

Individual Y's .02 from average? **PASS**
Individual $\Delta H_@$ values 0.15 from average? **PASS**
Average Y value +/-.02 of 1.000? **PASS**

(1) $V_m(std) = K_1 V_m \frac{P_{bar} + (\Delta H/13.6)}{T_m}$ = Net volume of gas sample passed through DGM, corrected to standard conditions

K_1 = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)
T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $V_{cr}(std) = K' \sqrt{\frac{P_{bar}\,\theta}{T_{amb}}}$ = Volume of gas sample passed through the critical orifice, corrected to standard conditions

T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)
K' = Average K' factor from Critical Orifice Calibration

(3) $Y = \frac{V_{cr}(std)}{V_m(std)}$ = DGM calibration factor

(4) $\Delta H_@ = \frac{\Delta H\, 0.0319\, T_m\, \theta^2}{P_{bar}\, Y^2\, V_m^2}$

Next Calibration Due By: 5/14/2022

15730.001.009
#1-2 CBs SO2
Emission Report

CALIBRATION GAS CERTIFICATES

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI80E15A0138	Reference Number:	122-402016392-1
Cylinder Number:	EB0062273	Cylinder Volume:	150.9 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22021	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Feb 01, 2021

Expiration Date: Feb 01, 2029

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	10.00 %	10.16 %	G1	+/- 0.6% NIST Traceable	02/01/2021
OXYGEN	10.00 %	10.14 %	G1	+/- 0.5% NIST Traceable	02/01/2021
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060638	CC414571	13.359 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 14, 2025
NTRM	10010616	K014963	9.967 % OXYGEN/NITROGEN	+/- 0.3%	Apr 19, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VA-5001 CO2 BF89GV17	Nondispersive Infrared (NDIR)	Jan 06, 2021
Horiba MPA510 O2 41499150042	Paramagnetic	Jan 07, 2021

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI60E15A0286	Reference Number:	122-401215331-1
Cylinder Number:	CC335419	Cylinder Volume:	159.6 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22018	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Jun 04, 2018

Expiration Date: Jun 04, 2026

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	20.00 %	19.81 %	G1	+/- 0.6% NIST Traceable	06/04/2018
OXYGEN	20.00 %	19.99 %	G1	+/- 0.3% NIST Traceable	06/04/2018
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061508	CC354696	19.87 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 11, 2024

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA510 CO2 2L6YXWY0	Nondispersive Infrared (NDIR)	May 10, 2018
Horiba MPA510 O2 41499150042	Paramagnetic	May 10, 2018

Triad Data Available Upon Request

Signature on file

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0259	Reference Number:	122-401777520-1
Cylinder Number:	EB0108003	Cylinder Volume:	144.4 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22020	Valve Outlet:	660
Gas Code:	SO2,BALN	Certification Date:	Apr 06, 2020

Expiration Date: Apr 06, 2028

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
SULFUR DIOXIDE	450.0 PPM	457.9 PPM	G1	+/- 0.8% NIST Traceable	03/30/2020, 04/06/2020
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801549 SO2	FTIR	Apr 02, 2020

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0051	Reference Number:	122-401777522-1
Cylinder Number:	CC259060	Cylinder Volume:	144.4 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22020	Valve Outlet:	660
Gas Code:	SO2,BALN	Certification Date:	Apr 07, 2020

Expiration Date: Apr 07, 2028

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
SULFUR DIOXIDE	900.0 PPM	910.7 PPM	G1	+/- 0.7% NIST Traceable	03/31/2020, 04/07/2020
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	16060235	CC470222	995.8 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.7%	Nov 10, 2021

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801549 SO2	FTIR	Apr 02, 2020

Triad Data Available Upon Request

Signature on file
Approved for Release

CYCLONIC FLOW CHECKS

Determination of Stack Gas Velocity - Method 2

Client	New Indy	Source	No. 1 Combination Boiler	Pitot Coeff (C_p)	0.84
Location/Plant	Catawba, SC	W.O. Number	15730.001.009	Stack Area (A_s), ft^2	78.54
Operator	RS	Date	10-13-21	Pitot/Thermo ID	P284 / A025

Run Number	Pre Run 1		
Time			
Barometric Press (P_{bar}), in Hg*	29.7		
Static Press (P_g), in H_2O	-1.2		
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? (Y) / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.04	7	A	1						
.04	7		2						
.05	9		3						
.03	5		4						
.01	6	B	1						
.04	5		2						
.03	5		3						
.03	7		4						
.05	9	C	1						
.02	7		2						
.02	4		3						
.02	3		4						
.07	6	D	1						
.06	5		2						
.03	5		3						
.02	5		4						
Avg Angle	<20	Avg Δp & Temp							

Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$
$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$
$T_{s(abs)} = T_s + 460$
$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$
$Q_{act} = 60 \times V_s \times A_s$
$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions.

*Barometric Pressure is at port elevation

Comments

WESTON SOLUTIONS
Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client: New Indy | Source: No. 2 Combination Boiler | Pitot Coeff (C_p): 0.84

Location/Plant: Catawba, SC | W.O. Number: 15730.001.009 | Stack Area (A_s), ft^2: 78.54

Operator: RS | Date: 10-14-21 | Pitot/Thermo ID: P284 / A625

Run Number	Pre Run 1 ABF & RS 10/14/21		
Time			
Barometric Press (P_{bar}), in Hg*	29.65		
Static Press (P_g), in H_2O	-1.1		
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? (Y) N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.06	9	A	1						
.06	7		2						
.05	9		3						
.05	5		4						
.05	7	B	1						
.04	7		2						
.04	5		3						
.04	5		4						
.03	5	C	1						
.05	6		2						
.06	6		3						
.04	4		4						
.05	7	D	1						
.04	7		2						
.03	4		3						
.03	4		4						
Avg Angle	6.20		Avg Δp & Temp						
			Avg $\sqrt{\Delta p}$						
			Average gas stream velocity, ft/sec.						
			Vol. flow rate at actual conditions, acf/min						
			Vol. flow rate at standard conditions, dscf/min						

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$

$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$

$T_{s(abs)} = T_s + 460$

$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$

$Q_{act} = 60 \times V_s \times A_s$

$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

WESTON SOLUTIONS
Integrated Air Services

STRATIFICATION AND RESPONSE TIME CHECKS

NO. 1 COMBINATION BOILER

Client: New Indy
Location: Catawba, SC
Date: 10/12/2021

WO# 15730.001.009
Source: No. 1 Combination Boiler
Operating load: Normal

Source

Port	Point	O2	% difference from Mean	Absolute difference	CO2	% difference from Mean	Absolute difference	SO2	% difference from Mean	Absolute difference
D	1	11.05	3.7%	0.396	8.10	2.7%	0.221	234.0	8.5%	18.250
	2	10.85	1.8%	0.196	8.25	0.9%	0.071	234.0	8.5%	18.250
	3	10.70	0.4%	0.046	8.40	1.0%	0.079	226.0	4.8%	10.250
C	1	10.45	1.9%	0.204	8.50	2.2%	0.179	209.5	2.9%	6.250
	2	10.65	0.0%	0.004	8.15	2.1%	0.171	202.0	6.4%	13.750
	3	10.60	0.5%	0.054	8.35	0.4%	0.029	190.5	11.7%	25.250
B	1	10.35	2.9%	0.304	8.65	4.0%	0.329	186.0	13.8%	29.750
	2	10.70	0.4%	0.046	8.25	0.9%	0.071	201.0	6.8%	14.750
	3	10.80	1.4%	0.146	8.10	2.7%	0.221	206.0	4.5%	9.750
A	1	10.95	2.8%	0.296	7.95	4.5%	0.371	219.5	1.7%	3.750
	2	10.35	2.9%	0.304	8.45	1.6%	0.129	232.0	7.5%	16.250
	3	10.40	2.4%	0.254	8.70	4.6%	0.379	248.5	15.2%	32.750
Mean:		10.65			8.32			215.75		

Compliance Testing	
Results	Not Stratified per O2
Sampling Approach	Sampled at single point which most closely represented the mean

EPA Part 60 Testing	
Results	Not Stratified per O2
Sampling Approach	Sampled at 0.4m, 1.0m and 2.0m from stack wall or sampled at 16.7%, 50%, and 83.3% of duct diameter

EPA Part 75 Testing	
Results	Not Stratified per O2
Sampling Approach	Sampled at single point located no less than 1m from the stack wall and located on the same line as the traverse test

Per EPA Method 7E, a 12 point traverse was conducted to measure for stratification of the flue gas. According to Method 7E, the gas stream can stratified, minimally stratified, or not stratified. If at each point any pollutant or diluent is determined to be less than 5% or 0.5 ppm different than the mean concentration, the source is not stratified. If at each point any pollutant or diluent is determined to be greater than 5% but less than 10% or greater than 0.5 ppm but less than 1.0 ppm different than the mean concentration, the source is minimally stratified. If at any point the pollutants and diluents are greater than 10% or 1.0 ppm different than the mean concentration, the source is stratified.

Per EPA Part 60, a 12 point traverse was conducted to measure for stratification of the flue gas. If at each point any pollutant or diluent is determined to be less than 10% different than the mean concentration, the source is not stratified. If at any point the pollutants or dilluents are greater than 10% different than the mean concentration, the source is stratified.

Per EPA Part 75, a 12 point traverse was conducted to measure for stratification of the flue gas. If at each point any pollutant or diluent is determined to be less than 5% different than the mean concentration, the source is not stratified. If at any point the pollutants are determined to be less than 3.0 ppm less than 3.0 ppm or the diluents determined to be less than 0.3% different than the mean concentration, the source is not stratified. If at any point the pollutants or diluents are greater than 5%, the pollutants are greater than 3.0 ppm, or the diluents are greater than 0.3% different than the mean concentration the source is stratified.

RUN DATA

Number 1

Client: **New Indy** Project Number: **15730.001.009**
Location: **Catawba, SC** Operator: **VD**
Source: **No. 1 Combination Boiler** Calibration **1** Date: **12 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
Stratification Check						
Response Time = 3.5 Minutes, timed during first bias						
Points selected by Table 1-2 of EPA Method 1						
Port D Point 1						
14:07	4603	11.6	2973	7.6	2269	235
14:08	4454	11.2	3078	7.9	2334	243
14:09	4439	11.2	3076	7.9	2381	248
14:10	4413	11.1	3097	7.9	2356	245
14:11	4417	11.1	3096	7.9	2255	234
14:12	4389	11.1	3137	8.0	2210	229
14:13	4369	11.0	3187	8.2	2301	239
Point 2						
14:14	4465	11.3	3125	8.0	2346	244
14:15	4416	11.1	3130	8.0	2306	239
14:16	4389	11.1	3147	8.1	2218	230
14:17	4366	11.0	3169	8.1	2171	225
14:18	4317	10.9	3217	8.2	2216	230
14:19	4328	10.9	3209	8.2	2253	234
14:20	4288	10.8	3245	8.3	2252	234
Point 3						
14:21	4280	10.8	3257	8.3	2180	226
14:22	4253	10.7	3281	8.4	2078	215
14:23	4250	10.7	3283	8.4	2066	213
14:24	4262	10.7	3274	8.4	2121	219
14:25	4253	10.7	3279	8.4	2212	229
14:26	4252	10.7	3281	8.4	2222	230
14:27	4230	10.7	3303	8.4	2141	222
Port Change						
14:28	4180	10.5	3350	8.6	2076	215
14:29	4162	10.5	3365	8.6	2151	223
14:30	7753	19.5	513	1.4	1278	128
14:31	8309	20.9	35	0.2	266	18
14:32	8296	20.9	39	0.2	165	7
14:33	4228	10.7	3305	8.4	969	94
Port C Point 1						
14:34	4033	10.2	3483	8.9	1950	201
14:35	4074	10.3	3446	8.8	2121	219
14:36	4117	10.4	3405	8.7	2150	223
14:37	4129	10.4	3393	8.7	2091	216
14:38	4196	10.6	3329	8.5	2037	210
14:39	4180	10.5	3322	8.5	2016	208

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **12 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
14:40	4140	10.4	3331	8.5	2040	211
			Point 2			
14:41	4123	10.4	3343	8.5	2088	216
14:42	4201	10.6	3271	8.4	2063	213
14:43	4430	11.2	3051	7.8	1907	196
14:44	4471	11.3	2987	7.7	1852	190
14:45	4354	11.0	3069	7.9	1863	191
14:46	4223	10.6	3189	8.2	1947	201
14:47	4249	10.7	3178	8.1	1969	203
			Point 3			
14:48	4334	10.9	3113	8.0	1877	193
14:49	4220	10.6	3230	8.3	1733	177
14:50	4204	10.6	3259	8.3	1724	176
14:51	4140	10.4	3322	8.5	1790	183
14:52	4152	10.5	3312	8.5	1894	195
14:53	4171	10.5	3295	8.4	1889	194
14:54	4231	10.7	3238	8.3	1826	187
			Port Change			
14:55	4124	10.4	3334	8.5	1790	183
14:56	4685	11.8	2920	7.5	1643	168
14:57	8298	20.9	47	0.3	177	8
14:58	6424	16.2	1480	3.9	522	46
14:59	4120	10.4	3343	8.5	1555	158
			Port B Point 1			
15:00	4066	10.3	3396	8.7	1633	166
15:01	4031	10.2	3429	8.8	1747	179
15:02	3968	10.0	3486	8.9	1840	189
15:03	3929	9.9	3523	9.0	1903	196
15:04	4043	10.2	3422	8.7	1863	191
15:05	4141	10.4	3349	8.6	1809	186
15:06	4097	10.3	3390	8.7	1814	186
			Point 2			
15:07	4086	10.3	3399	8.7	1889	194
15:08	4125	10.4	3361	8.6	1903	196
15:09	4237	10.7	3251	8.3	1953	201
15:10	4190	10.6	3292	8.4	1917	197
15:11	4268	10.8	3221	8.2	1863	191
15:12	4304	10.8	3180	8.1	1912	197
15:13	4214	10.6	3268	8.4	1992	205
			Point 3			
15:14	4197	10.6	3282	8.4	1977	204

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **12 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
15:15	4274	10.8	3207	8.2	1986	205
15:16	4236	10.7	3244	8.3	1944	200
15:17	4238	10.7	3242	8.3	1894	195
15:18	4231	10.7	3245	8.3	1922	198
15:19	4254	10.7	3224	8.2	2005	207
15:20	4341	10.9	3140	8.0	1991	205
Port Change						
15:21	4381	11.0	3102	7.9	1915	197
15:22	4444	11.2	3040	7.8	1906	196
15:23	7351	18.5	796	2.1	1457	147
15:24	8300	20.9	31	0.2	412	34
15:25	8304	20.9	26	0.2	210	12
15:26	6569	16.5	1346	3.5	286	20
Port A Point 1						
15:27	4338	10.9	3105	7.9	1754	180
15:28	4334	10.9	3111	8.0	2098	217
15:29	4265	10.8	3178	8.1	2242	233
15:30	4200	10.6	3241	8.3	2297	238
15:31	4245	10.7	3202	8.2	2255	234
15:32	4310	10.9	3140	8.0	2113	219
15:33	4360	11.0	3092	7.9	2127	220
Point 2						
15:34	4376	11.0	3079	7.9	2179	226
15:35	4456	11.2	3005	7.7	2231	231
15:36	4496	11.3	2967	7.6	2283	237
15:37	4474	11.3	2986	7.6	2231	231
15:38	4465	11.3	2978	7.6	2176	225
15:39	4488	11.3	2954	7.6	2232	231
15:40	4526	11.4	2917	7.5	2329	242
15:41	4610	11.6	2839	7.3	2338	243
15:42	4623	11.7	2829	7.3	2281	237
15:43	4586	11.6	2850	7.3	2209	229
15:44	4550	11.5	2876	7.4	2232	231
15:45	4535	11.4	2889	7.4	2323	241
15:46	4476	11.3	2945	7.5	2371	247
15:47	4476	11.3	2949	7.6	2284	237
15:48	4513	11.4	2915	7.5	2177	225
15:49	4391	11.1	3030	7.8	2201	228
15:50	4410	11.1	3013	7.7	2250	233
15:51	4354	11.0	3061	7.8	2313	240
15:52	4303	10.8	3112	8.0	2268	235

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **12 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
15:53	4294	10.8	3121	8.0	2167	224
15:54	4343	10.9	3075	7.9	2164	224
15:55	4338	10.9	3079	7.9	2161	224
15:56	4295	10.8	3119	8.0	2243	233
15:57	4271	10.8	3148	8.1	2252	234
15:58	4277	10.8	3143	8.0	2136	221
15:59	4283	10.8	3140	8.0	2093	216
16:00	4196	10.6	3224	8.2	2114	219
16:01	4142	10.4	3277	8.4	2200	228
16:02	4099	10.3	3315	8.5	2270	236
			Point 3			
16:03	4106	10.4	3310	8.5	2280	237
16:04	4079	10.3	3337	8.5	2236	232
16:05	4010	10.1	3397	8.7	2237	232
16:06	3962	10.0	3446	8.8	2311	240
16:07	3956	10.0	3449	8.8	2354	245
16:08	3936	9.9	3466	8.9	2367	246
16:09	3843	9.7	3553	9.1	2311	240
16:10	3816	9.6	3589	9.2	2286	237
16:11	3822	9.6	3597	9.2	2362	246
16:12	3816	9.6	3604	9.2	2407	250
16:13	3878	9.8	3550	9.1	2362	246
16:14	3960	10.0	3493	8.9	2250	233
16:15	3872	9.8	3580	9.1	2213	229
16:16	3828	9.7	3636	9.3	2256	234
16:17	3961	10.0	3534	9.0	2324	241
16:18	3958	10.0	3542	9.0	2376	247
16:19	4050	10.2	3461	8.8	2282	237
16:20	4079	10.3	3430	8.8	2204	228
16:21	4061	10.2	3440	8.8	2221	230
16:22	3962	10.0	3534	9.0	2336	243
16:23	3965	10.0	3530	9.0	2416	251
16:24	3923	9.9	3577	9.1	2371	247
16:25	3863	9.7	3639	9.3	2291	238
16:26	3906	9.9	3617	9.2	2290	238
16:27	3921	9.9	3605	9.2	2362	246
16:28	4007	10.1	3525	9.0	2430	253
16:29	4069	10.3	3472	8.9	2421	252
16:30	4108	10.4	3439	8.8	2334	243
16:31	4086	10.3	3457	8.8	2230	231
16:32	4117	10.4	3430	8.8	2256	234

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **12 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
16:33	4139	10.4	3407	8.7	2352	244
16:34	4138	10.4	3408	8.7	2433	253
Avgs	**4433**	**11.2**	**3088**	**7.9**	**2027**	**209**

BIAS
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **12 Oct 2021**

Start Time: 12:06

O_2
Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-2	0.0	0.0	0.0	Pass
Span	10.1	4004	10.1	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	-0	0.1	0.0	0.0	Pass
Span	9.9	3863	9.9	0.0	0.0	Pass

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	6	150	5	-1	-0.1	Pass
Span	445	4135	438	-7	-0.8	Pass

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **12 Oct 2021**

Start Time: 16:36

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	1	0.0	0.0	0.0	Pass
Span	10.1	3988	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	1	0.0	0.0	0.0	Pass
Span	10.1	3988	10.1	0.0	0.0	Pass

*Bias No. 1

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	32	0.2	0.1	0.5	Pass
Span	9.9	3896	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.1	32	0.2	0.1	0.5	Pass
Span	9.9	3896	9.9	0.0	0.0	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **12 Oct 2021**

Start Time: 16:36

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	6	153	6	0	0.0	Pass
Span	445	4127	437	-8	-0.9	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	5	153	6	1	0.1	Pass
Span	438	4127	437	-1	-0.1	Pass

*Bias No. 1

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **12 Oct 2021**

Start Time: 11:43

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	-4
10.1	EB0062273	3992
20.0	CC335419	7960

Curve Coefficients

Slope	Intercept	Corr. Coeff.
398.4	-18	>0.9999

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	-4
10.2	EB0062273	3873
19.8	CC335419	7887

Curve Coefficients

Slope	Intercept	Corr. Coeff.
398.2	-59	0.9997

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **12 Oct 2021**

Start Time: 11:43

SO_2
Method: EPA 6C
Calibration Type: Linear Regression

Calibration Results

ppm	Cylinder ID	Result, mv
Zero	-	159
458	EB0108003	4199
911	CC259060	8551

Curve Coefficients

Slope	Intercept	Corr. Coeff.
9.214	100	0.9997

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **12 Oct 2021**

Start Time: 11:43

O_2

Method: EPA 3A
Span Conc. 20.0 %
Slope 398.4 **Intercept** -18.4

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-4	0.0	0.0	0.0	Pass
10.1	3992	10.1	0.0	0.0	Pass
20.0	7960	20.0	0.0	0.0	Pass

CO_2

Method: EPA 3A
Span Conc. 19.8 %
Slope 398.2 **Intercept** -59.2

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-4	0.1	0.1	0.5	Pass
10.2	3873	9.9	-0.3	-1.5	Pass
19.8	7887	20.0	0.2	1.0	Pass

SO_2

Method: EPA 6C
Span Conc. 911 ppm
Slope 9.214 **Intercept** 100

Standard ppm	Response mv	Result ppm	Difference ppm	Error %	Status
Zero	159	6	6	0.7	Pass
458	4199	445	-13	-1.4	Pass
911	8551	917	6	0.7	Pass

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **12 Oct 2021**

File: C:\Users\Dubayv\Desktop\new indy\211012 New Indy Catawba No. 1 Combination Boiler Strat.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSTRLXX-PC **Trailer:** 88
Analog Input Device: MCC USB-1608G

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**20.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.8**

Channel 5

Analyte	**SO_2**
Method	**EPA 6C**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T100H SN410**
Full-Scale Output, mv	**10000**
Analyzer Range, ppm	**1000**
Span Concentration, ppm	**911**

NO. 2 COMBINATION BOILER

Client New Indy
Location Catawba, SC
Date 10/13/2021

WO# 15730.001.009
Source No. 2 Combination Boiler

Source

Port	Point	O2	% difference from Mean	Absolute difference	CO2	% difference from Mean	Absolute difference	SO2	% difference from Mean	Absolute difference
A	1	11.20	1.9%	0.217	8.40	3.9%	0.313	35.0	5.3%	1.958
	2	11.30	1.0%	0.117	8.30	2.6%	0.213	34.0	8.0%	2.958
	3	11.40	0.1%	0.017	8.20	1.4%	0.112	38.0	2.8%	1.042
B	1	11.60	1.6%	0.183	8.05	0.5%	0.037	35.5	3.9%	1.458
	2	11.35	0.6%	0.067	8.30	2.6%	0.213	35.0	5.3%	1.958
	3	11.65	2.0%	0.233	8.00	1.1%	0.088	35.0	5.3%	1.958
C	1	11.55	1.2%	0.133	7.85	2.9%	0.238	37.0	0.1%	0.042
	2	11.40	0.1%	0.017	8.00	1.1%	0.088	36.0	2.6%	0.958
	3	11.00	3.6%	0.417	8.35	3.2%	0.262	37.5	1.5%	0.542
D	1	11.40	0.1%	0.017	8.00	1.1%	0.088	40.5	9.6%	3.542
	2	11.75	2.9%	0.333	7.70	4.8%	0.388	39.5	6.9%	2.542
	3	11.40	0.1%	0.017	7.90	2.3%	0.188	40.5	9.6%	3.542
Mean:		11.42			8.09			36.96		

Compliance Testing	
Results	Not Stratified per O2
Sampling Approach	Sampled at single point which most closely represented the mean

EPA Part 60 Testing	
Results	Not Stratified per O2
Sampling Approach	Sampled at 0.4m, 1.0m and 2.0m from stack wall or sampled at 16.7%, 50%, and 83.3% of duct diameter

EPA Part 75 Testing	
Results	Not Stratified per O2
Sampling Approach	Sampled at single point located no less than 1m from the stack wall and located on the same line as the traverse test

Per EPA Method 7E, a 12 point traverse was conducted to measure for stratification of the flue gas. According to Method 7E, the gas stream can stratified, minimally stratified, or not stratified. If at each point any pollutant or diluent is determined to be less than 5% or 0.5 ppm different than the mean concentration, the source is not stratified. If at each point any pollutant or diluent is determined to be greater than 5% but less than 10% or greater than 0.5 ppm but less than 1.0 ppm different than the mean concentration, the source is minimally stratified. If at any point the pollutants and diluents are greater than 10% or 1.0 ppm different than the mean concentration, the source is stratified.

Per EPA Part 60, a 12 point traverse was conducted to measure for stratification of the flue gas. If at each point any pollutant or diluent is determined to be less than 10% different than the mean concentration, the source is not stratified. If at any point the pollutants or dilluents are greater than 10% different than the mean concentration, the source is stratified.

Per EPA Part 75, a 12 point traverse was conducted to measure for stratification of the flue gas. If at each point any pollutant or diluent is determined to be less than 5% different than the mean concentration, the source is not stratified. If at any point the pollutants are determined to be less than 3.0 ppm less than 3.0 ppm or the diluents determined to be less than 0.3% different than the mean concentration, the source is not stratified. If at any point the pollutants or diluents are greater than 5%, the pollutants are greater than 3.0 ppm, or the diluents are greater than 0.3% different than the mean concentration the source is stratified.

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
Stratification Check						
Response Time = 3.5 minutes, timed during first bias						
Points selected by Table 1-2 of EPA Method 1						
Port A Point 1						
19:21	4807	12.2	2925	7.4	323	27
19:22	4724	12.0	3007	7.6	399	34
19:23	4727	12.0	3008	7.6	403	35
19:24	4727	12.0	3012	7.6	408	35
19:25	4574	11.6	3157	8.0	412	35
19:26	4416	11.2	3312	8.4	411	35
19:27	4413	11.2	3316	8.4	405	35
Point 2						
19:28	4429	11.2	3301	8.4	394	34
19:29	4452	11.3	3281	8.3	394	34
19:30	4451	11.3	3279	8.3	402	34
19:31	4451	11.3	3280	8.3	409	35
19:32	4458	11.3	3272	8.3	415	36
19:33	4446	11.3	3287	8.3	405	35
19:34	4461	11.3	3269	8.3	391	33
Point 3						
19:35	4350	11.0	3374	8.6	388	33
19:36	4313	10.9	3412	8.6	393	34
19:37	4340	11.0	3389	8.6	407	35
19:38	4433	11.2	3303	8.4	424	37
19:39	4467	11.3	3271	8.3	428	37
19:40	4532	11.5	3212	8.1	433	38
19:41	4465	11.3	3275	8.3	437	38
Port Change						
19:42	4482	11.4	3256	8.3	430	37
19:43	5441	13.8	2464	6.3	401	34
19:44	8204	20.7	88	0.3	54	0
19:45	7521	19.0	648	1.7	47	0
Port B Point 1						
19:46	4641	11.8	3098	7.9	325	27
19:47	4712	11.9	3034	7.7	376	32
19:48	4585	11.6	3156	8.0	416	36
19:49	4513	11.4	3224	8.2	417	36
19:50	4539	11.5	3203	8.1	414	36
19:51	4564	11.6	3181	8.1	422	36
19:52	4575	11.6	3168	8.0	404	35

RUN DATA

Number 1

Client: **New Indy** | Project Number: **15730.001.009**
Location: **Catawba, SC** | Operator: **VD**
Source: **No. 2 Combination Boiler** | Calibration **1** | Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
			Point 2			
19:53	4512	11.4	3232	8.2	389	33
19:54	4526	11.5	3217	8.2	388	33
19:55	4485	11.4	3257	8.3	398	34
19:56	4469	11.3	3271	8.3	399	34
19:57	4549	11.5	3196	8.1	396	34
19:58	4521	11.5	3220	8.2	400	34
19:59	4423	11.2	3313	8.4	416	36
			Point 3			
20:00	4441	11.3	3296	8.4	417	36
20:01	4467	11.3	3274	8.3	409	35
20:02	4514	11.4	3229	8.2	405	35
20:03	4476	11.4	3264	8.3	417	36
20:04	4457	11.3	3282	8.3	423	37
20:05	4544	11.5	3205	8.1	414	36
20:06	4639	11.8	3111	7.9	400	34
			Port Change			
20:07	4697	11.9	3053	7.7	400	34
20:08	5909	14.9	2053	5.2	354	30
20:09	8195	20.7	84	0.3	45	0
20:10	7785	19.6	408	1.1	41	0
20:11	4695	11.9	3045	7.7	315	26
			Port C Point 1			
20:12	4621	11.7	3123	7.9	366	31
20:13	4599	11.7	3149	8.0	409	35
20:14	4677	11.9	3070	7.8	415	36
20:15	4748	12.0	3001	7.6	407	35
20:16	4783	12.1	2966	7.5	403	35
20:17	4763	12.1	2982	7.6	408	35
20:18	4832	12.2	2915	7.4	404	35
20:19	4749	12.0	2951	7.5	401	34
20:20	4728	12.0	2934	7.4	412	35
20:21	4759	12.1	2901	7.4	421	36
20:22	4725	12.0	2934	7.4	419	36
20:23	4650	11.8	3007	7.6	421	36
20:24	4574	11.6	3081	7.8	427	37
20:25	4538	11.5	3118	7.9	427	37
			Point 2			
20:26	4575	11.6	3084	7.8	426	37
20:27	4616	11.7	3041	7.7	423	37
20:28	4621	11.7	3037	7.7	414	36

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
20:29	4640	11.8	3023	7.7	408	35
20:30	4621	11.7	3040	7.7	414	36
20:31	4616	11.7	3045	7.7	413	36
20:32	4601	11.7	3064	7.8	407	35
20:33	4669	11.8	2995	7.6	404	35
20:34	4622	11.7	3035	7.7	408	35
20:35	4564	11.6	3090	7.8	417	36
20:36	4480	11.4	3172	8.0	417	36
20:37	4485	11.4	3170	8.0	421	36
Point 3						
20:38	4472	11.3	3185	8.1	427	37
20:39	4452	11.3	3205	8.1	435	38
20:40	4458	11.3	3200	8.1	425	37
20:41	4432	11.2	3223	8.2	426	37
20:42	4403	11.2	3252	8.2	429	37
20:43	4386	11.1	3270	8.3	431	37
20:44	4291	10.9	3298	8.4	438	38
Port Change						
20:45	4244	10.8	3331	8.4	434	38
20:46	4231	10.7	3351	8.5	435	38
20:47	6115	15.5	1826	4.7	336	28
20:48	8214	20.7	80	0.3	43	0
20:49	6072	15.4	1806	4.6	165	11
Port D Point 1						
20:50	4407	11.2	3177	8.1	392	33
20:51	4303	10.9	3276	8.3	426	37
20:52	4347	11.0	3251	8.2	448	39
20:53	4492	11.4	3164	8.0	466	41
20:54	4508	11.4	3147	8.0	464	41
20:55	4500	11.4	3152	8.0	463	40
20:56	4484	11.4	3169	8.0	464	41
Point 2						
20:57	4503	11.4	3150	8.0	475	42
20:58	4535	11.5	3121	7.9	479	42
20:59	4618	11.7	3054	7.7	479	42
21:00	4738	12.0	2962	7.5	473	41
21:01	4779	12.1	2924	7.4	479	42
21:02	4794	12.1	2909	7.4	475	42
21:03	4773	12.1	2929	7.4	472	41
21:04	4773	12.1	2930	7.4	478	42
21:05	4733	12.0	2967	7.5	471	41

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
21:06	4674	11.8	3025	7.7	476	42
21:07	4747	12.0	2945	7.5	472	41
21:08	4808	12.2	2860	7.3	460	40
21:09	4749	12.0	2914	7.4	464	41
21:10	4724	12.0	2938	7.5	477	42
21:11	4650	11.8	3010	7.6	473	41
21:12	4635	11.8	3028	7.7	460	40
21:13	4621	11.7	3042	7.7	449	39
			Point 3			
21:14	4624	11.7	3039	7.7	451	39
21:15	4622	11.7	3039	7.7	462	40
21:16	4686	11.9	2980	7.6	461	40
21:17	4543	11.5	3061	7.8	458	40
21:18	4516	11.5	3074	7.8	464	41
21:19	4489	11.4	3100	7.9	470	41
21:20	4480	11.4	3107	7.9	463	40
Avgs	**4750**	**12.0**	**2974**	**7.5**	**404**	**35**

BIAS
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 18:43

O_2
Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-72	0.0	0.0	0.0	Pass
Span	10.1	3945	10.0	-0.1	-0.5	Pass

CO_2
Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	52	0.2	0.1	0.5	Pass
Span	9.9	3920	9.9	0.0	0.0	Pass

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	146	9	8	0.9	Pass
Span	457	4612	453	-4	-0.4	Pass

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 21:21

O_2

Method: EPA 3A
Span Conc. 20.0 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	-37	0.0	0.0	0.0	Pass
Span	10.1	3930	10.0	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	-37	0.0	0.0	0.0	Pass
Span	10.0	3930	10.0	0.0	0.0	Pass

*Bias No. 1

CO_2

Method: EPA 3A
Span Conc. 19.8 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.1	42	0.2	0.1	0.5	Pass
Span	9.9	3902	9.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.2	42	0.2	0.0	0.0	Pass
Span	9.9	3902	9.9	0.0	0.0	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 21:21

SO_2
Method: EPA 6C
Span Conc. 911 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	140	8	7	0.8	Pass
Span	457	4559	447	-10	-1.1	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	9	140	8	-1	-0.1	Pass
Span	453	4559	447	-6	-0.7	Pass

*Bias No. 1

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 07:38

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	-38
10.1	EB0062273	3962
20.0	CC335419	7937

Curve Coefficients

Slope	Intercept	Corr. Coeff.
398.9	-53	>0.9999

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	32
10.2	EB0062273	3892
19.8	CC335419	7913

Curve Coefficients

Slope	Intercept	Corr. Coeff.
397.7	-27	0.9996

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 07:38

SO_2
Method: EPA 6C
Calibration Type: Linear Regression

Calibration Results

ppm	Cylinder ID	Result, mv
Zero	-	61
458 ✓	EB0108003	4654
911	CC259060	9230

Curve Coefficients

Slope	Intercept	Corr. Coeff.
10.07	55	>0.9999 ✓

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler** Calibration **1**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

Start Time: 07:38

O_2

Method: EPA 3A
Span Conc. 20.0 %
Slope 398.9 **Intercept** -52.9

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-38	0.0	0.0	0.0	Pass
10.1	3962	10.1	0.0	0.0	Pass
20.0	7937	20.0	0.0	0.0	Pass

CO_2

Method: EPA 3A
Span Conc. 19.8 %
Slope 397.7 **Intercept** -27.1

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	32	0.1	0.1	0.5	Pass
10.2	3892	9.9	-0.3	-1.5	Pass
19.8	7913	20.0	0.2	1.0	Pass

SO_2

Method: EPA 6C
Span Conc. 911 ppm
Slope 10.07 **Intercept** 55

Standard ppm	Response mv	Result ppm	Difference ppm	Error %	Status
Zero	61	1	1	0.1	Pass
458	4654	457	-1	-0.1	Pass
911	9230	911	0	0.0	Pass

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.009**
Operator: **VD**
Date: **13 Oct 2021**

File: C:\Data\211013 New Indy Catawba No. 2 Combination Boiler Strat.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSTRLXX-PC **Trailer:** 88
Analog Input Device: MCC USB-1608G

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**20.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 s/n: E08008-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.8**

Channel 5

Analyte	**SO_2**
Method	**EPA 6C**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T100H SN410**
Full-Scale Output, mv	**10000**
Analyzer Range, ppm	**1000**
Span Concentration, ppm	**911**

INTERFERENCE CHECKS

Method 7E-Interfernce Response

Applies to Models: 600 Series NDIR/PMD, 100/200/300 Series NDIR/PMD, ZRE w/PMD
Date of Test: 1/26/2011
Analyzer Type: PMD
Model: 602-P
Serial Numer: U09018-M
Calibration Span: 20.7% O2, balance N2

Test Gas	Interfernt Concentration	Zero Response	Span Response	Interferent Response
SO2	513 ppm	0.000%	0.020%	0.020%
H2O	0.82%	0.015%	0.020%	0.020%
N2O	10.00 ppm	0.000%	0.000%	0.000%
NO	94.9 ppm	0.000%	0.000%	0.000%
NO2	99.8 ppm	0.000%	0.000%	0.000%
CO	900 ppm	0.000%	0.000%	0.000%
CH4	90.9 ppm	0.000%	0.000%	0.000%
HCl	27.99ppm	0.000%	0.000%	0.000%
Sum of Responses				0.004%
% of Calibration Span				0.019%

Method 7E-Interfernce Response

Applies to Models: 600 Series NDIR, 100/200/300 Series NDIR, ZRE
Date of Test: 1/26/2011
Analyzer Type: NDIR
Model: 602-P
Serial Numer: U09018-M
Calibration Span: 20.2% CO2/Balance N2

Test Gas	Interfernt Concentration	Zero Response	Span Response	Interferent Response
SO2	102.6 ppm	0.000%	0.000%	0.000%
H2O	0.82%	0.055%	0.055%	0.055%
N2O	10.00 ppm	0.005%	0.010%	0.010%
NO	94.9 ppm	0.005%	0.025%	0.025%
NO2	99.8 ppm	0.010%	0.010%	0.010%
CO	100.0 ppm	0.010%	0.010%	0.010%
CH4	101.0 ppm	0.010%	0.010%	0.010%
HCl	27.99ppm	0.010%	0.010%	0.010%
Sum of Responses				0.013%
% of Calibration Span				0.064%

TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company
9480 Carroll Park Drive
San Diego, CA 92121-5201

August 4, 2014

To Whom It May Concern:

Teledyne Advanced Pollution Instrumentation has introduced new instrument models to replace our existing E Series gas analyzers. The new instruments are collectively referred to as our T Series models.

The fundamental design and all critical wetted, electronic, electrical and analytical components of the T Series instruments are identical to the E Series, including: UV sources, photo detectors, power supplies, pressure and flow transducers, pneumatic connectors and valves as well as external signal I/O connectors for serial data (RS-232/485 and Ethernet), analog concentration and status signals, and control inputs.

The design of all analytical algorithms, signal processing and control software algorithms are identical as well, including A/D measurements, digital signal filtering, concentration calculations, calibration factors and algorithms, temperature and pressure compensation, temperature control loops.

The primary differences between the models E Series and T Series instrument designs are provided below:

1. The 2 line by 40 character vacuum fluorescent display module is replaced by a 7" color LCD display with a touch screen interface. The current human user interface is emulated on the color, graphical display. The touch screen is used to emulate the existing 8 button context sensitive keyboard.
2. The software platform has been upgraded to support the graphical display and touchscreen. Software routines have been added to support the new analog input option, and a native Ethernet port on the CPU.
3. An upgraded CPU board that includes hardware to drive the LCD display and is backwards compatible with the current E-series CPU is used for the T-series analyzers.
4. A new front panel assembly has been designed to house the new display, and a new 9-pin connector will be added to the rear panel to support the new analog input option.
5. The new analog input option is designed to permit users to display and log, using the analyzer's internal data logger, signals from meteorological and other miscellaneous external sensors. None of the external signals are used in the calculations that yield calibrated concentration.

Internal production testing of the T Series analyzers that have been manufactured to date has shown that they meet the same analytical specifications as the equivalent E Series analyzers, including noise, linearity, drift, and response time.

We feel that, due to the nature of the changes described above and the testing performed to date, the modifications will not affect the performance characteristics of the analyzer.

Best Regards,

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Teledyne Advanced Pollution Instrumentation
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Method 7E Results for TAPI High Level Gas Analyzers

Potential Interferent Gas	Potential Interferent Gas Concentration	Instrument Type									
		M100EH	M200EM	M200EH	M200EH CO2 Sensor	M201E	M300E	M300EM	M320E	M803E O2 Sensor	M803E CO2 Sensor
SO2	20 ppmv		0.012	-0.167	-0.014	0.001	-0.058	-0.092	-0.106	-0.061	-0.015
NO	15 ppmv	0.162			0.002		-0.015	-0.054	-0.035	-0.051	-0.015
NO2	15 ppmv	0.053			-0.026		-0.059	-0.007	0.041	-0.051	-0.027
N2O	10 ppmv	-0.198	-0.033	-0.166	-0.036	0.040	0.113	-0.009		-0.041	-0.034
CO	50 ppmv	-0.084	0.022	-0.211	0.000	-0.005			-2.518	-0.164	-0.034
CH4	50 ppmv	-0.051	-0.042	-0.461	-0.043	0.037	-0.025	-0.030	-0.068	0.000	-0.015
H2	50 ppmv	-0.230	-0.035	-0.253	-0.038	0.030	-0.061	-0.128	0.000	-0.010	-0.008
CO2	15%	0.361	-2.397	-0.808		-1.076	0.470	0.313	7.843	-0.026	
NH3	10 ppmv	0.000	0.000		0.000		0.000	0.000	0.000	0.000	0.000
HCl	10 ppmv	0.047	0.168	-0.133	-0.032	0.078	-0.002	-0.087	0.073	-0.043	-0.027
H2O	1%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Absolute Sum of Responses		1.186	2.710	2.198	0.191	1.268	0.803	0.720	10.685	0.447	0.175
Calibration Span		90 ppm	90 ppm	90 ppm	15 %	18 ppm	90 ppm	90 ppm	90 ppm	20.95 %	15 %
Percent of Calibration Span		1.318	3.011	2.442	1.273	7.046	0.892	0.800	11.872	2.134	1.163

TABLE 7E–3—EXAMPLE INTERFERENCE CHECK GAS CONCENTRATIONS

Potential interferent gas[1]	Concentrations[2] sample conditioning type	
	Hot wet	Dried
CO_2	5 and 15%	5 and 15%
H_2O	25%	1%
NO	15 ppmv	15 ppmv
NO_2	15 ppmv	15 ppmv
N_2O	10 ppmv	10 ppmv
CO	50 ppmv	50 ppmv
NH_3	10 ppmv	10 ppmv
CH_4	50 ppmv	50 ppmv
SO_2	20 ppmv	20 ppmv
H_2	50 ppmv	50 ppmv
HCl	10 ppmv	10 ppmv

(1) Any applicable gas may be eliminated or tested at a reduced level if the manufacturer has provided reliable means for limiting or scrubbing that gas to a specified level.
(2) As practicable, gas concentrations should be the highest expected at test sites.

TABLE 7E–4—INTERFERENCE RESPONSE

Date of Test: _____

Analyzer Type: _____
Model No.: _____
Serial No: _____
Calibration Span: _____

Test gas type	Concentration (ppm)	Analyzer response
	Sum of Responses	
	% of Calibration Span	

PROJECT TEAM QUALIFICATIONS

Weston Solutions, Inc. Integrated Air Services Employee Qualifications

Name	Title/Position	Education/Training	QSTI	Years of Experience	
				Total	Emission Testing
Bryant, Ashley	Report Coordinator	BS - English Ed. - Jacksonville State University (2011) MA - English - Jacksonville State University (2012)	QSTI 1	9	9
Dubay, Van	Emissions Testing Specialist	BS - Horticulture Auburn University (2007)	QSTI 1, 3, & 4	6	6
Ennis, Brock	Emissions Testing Specialist	BA - Urban Environmental Studies Birmingham-Southern College (2021)		1	1
Hammonds, Natalie	Quality Manager	BS - Environmental Science Auburn University (1998)	QSTI 1	23	18
Roberts, Wayne	Operations Manager	BS - Env. Science AU (1992)		28	27
Scroggins, Robert	Emissions Testing Specialist	BA - Geography Auburn University (2012)	QSTI 1	2	2

APPENDIX E
PROCESS OPERATING/PRODUCTION DATA

NO. 1 COMBINATION BOILER

Combination Boiler #1

Condition 1: With NCGs, with SOGs
13-Oct-21

Run #	Start Time	Steam Rate (10^3 lbs/hr)	Bark Rate (Tons/Hr)	Gas Flow (10^3 SCF/Hr)	TDF (TPH)	NCG Scrubber Flow (GPM)	NCG Scrubber pH (SU)	Stripper Foul Condensate Flow (GPM)	Hard Pipe Foul Condensate Flow (GPM)	LVHC Flow to Boilers (SCFM)	SOG Flow to Boilers (SCFM)	HVLC Flow to Boilers (SCFM)	Pulp Production (ODT/Hr)	Pulp KAPPA
1	0844	262.3	29.9	126.9	1.23	40	10.9	511	230	1407	1103	10851	77.3	82.7
2	1029	266.3	33.0	109.1	1.23	40	10.9	505	213	1409	1200	10885	77.3	85.7
3	1206	257.2	32.6	100.4	1.23	40	10.9	504	2	1443	1206	10963	77.3	84.8
Average:		261.9	31.8	112.1	1.23	40	10.9	507	148	1420	1170	10900	77.3	84.4

Condition 2: With NCGs, without SOGs
13-Oct-21

Run #	Start Time	Steam Rate (10^3 lbs/hr)	Bark Rate (Tons/Hr)	Gas Flow (10^3 SCF/Hr)	TDF (TPH)	NCG Scrubber Flow (GPM)	NCG Scrubber pH (SU)	Stripper Foul Condensate Flow (GPM)	Hard Pipe Foul Condensate Flow (GPM)	LVHC Flow to Boilers (SCFM)	SOG Flow to Boilers (SCFM)	HVLC Flow to Boilers (SCFM)	Pulp Production (ODT/Hr)	Pulp KAPPA
1	1407	267.7	34.0	102.0	1.23	40	10.9	506	2	1416	[redacted]	11071	79.0	83.9
2	1544	272.9	34.8	101.3	1.23	40	10.9	504	252	1414	[redacted]	10976	79.0	81.6
3	1714	256.9	30.05	115.96	1.23	40	10.9	505	183	1430	[redacted]	11061	79.0	80.3
Average:		265.8	33.0	106.4	1.23	40	10.9	505	146	1420	[redacted]	11036	79.0	81.9

NO. 2 COMBINATION BOILER

Combination Boiler #2

Condition 1: With NCGs, with SOGs
14-Oct-21

Run #	Start Time	Steam Rate (10^3 lbs/hr)	Bark Rate (Tons/Hr)	Gas Flow (10^3 SCF/Hr)	TDF (TPH)	NCG Scrubber Flow (GPM)	NCG Scrubber pH (SU)	Stripper Foul Condensate Flow (GPM)	Hard Pipe Foul Condensate Flow (GPM)	LVHC Flow to Boilers (SCFM)	SOG Flow to Boilers (SCFM)	HVLC Flow to Boilers (SCFM)	Pulp Production (ODT/Hr)	Pulp KAPPA
1	0830	241	29.8	188.7	1.23	40	10.9	505	209	1409	1203	11071	91.1	94.5
2	1026	251	46.3	115.6	1.23	40	10.9	504	200	1420	1179	11160	91.1	88.2
3	1222	211	25.4	171.4	1.23	40	10.9	505	199	1429	1157	11090	91.1	80.7
Average:		234	33.8	158.6	1.23	40	10.9	505	203	1419	1180	11107	91.1	87.8

Condition 2: With NCGs, without SOGs
14-Oct-21

Run #	Start Time	Steam Rate (10^3 lbs/hr)	Bark Rate (Tons/Hr)	Gas Flow (10^3 SCF/Hr)	TDF (TPH)	NCG Scrubber Flow (GPM)	NCG Scrubber pH (SU)	Stripper Foul Condensate Flow (GPM)	Hard Pipe Foul Condensate Flow (GPM)	LVHC Flow to Boilers (SCFM)	SOG Flow to Boilers (SCFM)	HVLC Flow to Boilers (SCFM)	Pulp Production (ODT/Hr)	Pulp KAPPA
1	1410	198	21.7	174.8	1.23	40	10.9	505	209	1438		11109	92.9	78.8
2	1547	218	35.4	206.4	1.23	40	10.9	505	224	1435		11060	92.9	78.7
3	1725	214	49.6	220.6	0.65	40	10.9	505	262	1453		10977	92.9	79.3
Average:		210	35.6	200.6	1.04	40	10.9	505	232	1442		11049	92.9	

END OF DOCUMENT